PB90-150962

Superfund Record of Decision (EPA Region 2): Ewan Property, NJ (Second Remedial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

29 Sep 89

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National Technical Information Service
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REPORT DOCUMENTATION PAGE

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EPA/ROD/R02-89/095

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Ewan Property, NJ
Second Remedial Action - Final

5. Report Date
09/29/89

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Washington, D.C. 20460

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800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 43-acre Ewan Property site is in the New Jersey Pinelands in Shamong Township, Burlington County, New Jersey. The site neighbors forests and forested wetlands, farmland, and residences. An aquifer underlying the site contains a plume contaminated by onsite disposal practices. Between 1974 and 1975 the site owner reportedly buried uncontained and drummed hazardous wastes in an onsite disposal area. In 1982 the county was informed of the possible hazardous waste dumping and initiated ground water monitoring and soil sampling programs the following year. Both the ground water and soil within the disposal area were found to be contaminated with VOCs and metals. This remedial action represents the second of two operable units for the site. The 1988 Record of Decision addressed the treatment of 4,500 cubic yards of source waste including buried drums and other heavily contaminated materials. This second operable unit addresses the remediation of the residual soil which will remain after implementation of the first operable unit and the treatment of the contaminated ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; and metals including chromium and lead. (Continued on next page).

17. Document Analysis a. Descriptors
Record of Decision - Ewan Property, NJ
Second Remedial Action - Final
Contaminated Media: soil, gw
Key Contaminants: VOCs (benzene, PCE, TCE, toluene, xylenes), metals (lead, chromium)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report)
None

20. Security Class (This Page)
None

21. No. of Pages
121

22. Price
A06

(See ANSI-Z39.18)

See Instructions on Reverse

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PB90-150962

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-89/095
September 1989

EPA

Superfund Record of Decision:

Ewan Property, NJ

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U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

16. Abstract (Continued)

EPA/ROD/R02-89/095
Ewan Property, NJ

The selected remedial action for this site includes excavating and treating 22,000 cubic yards of soil using solvent extraction and soil washing, followed by redepositing treated soil onsite as clean fill; treating and disposing of spent solvent offsite; treating spent wash water onsite using the ground water treatment system; regrading and revegetating disposal areas; pumping and treatment of ground water followed by reinjecting treated ground water into the underlying aquifer; and environmental monitoring. The estimated present worth cost for this remedial action is $35,152,447 which includes annual O&M costs of $1,903,980.

ATTENTION

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DECLARATION STATEMENT

RECORD OF DECISION

EWAN PROPERTY (OPERABLE UNIT TWO)

Site Name and Location

Ewan Property, Shamong Township, Burlington County, New Jersey

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Ewan Property site, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and, to the extent applicable, the National Contingency Plan. This decision is based on the administrative record on file for the site.

The State of New Jersey has concurred with the selected remedial technology.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response actions selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Remedy

The remedial action described in this document represents the second of two planned operable units for the site. The first operable unit, which was the subject of a Record of Decision signed in September 1988, addressed buried drums and heavily contaminated materials. This action will address the residually contaminated soil at the site and the contaminated ground water in the underlying aquifer.

The major components of the selected remedy include:

- Excavation and treatment, via solvent extraction and soil washing, of residually contaminated soils, followed by placement of the treated soils back onto the site;

- Collection and treatment of the contaminated ground water, and reinjection of the treated ground water into the underlying aquifer;
- Recontouring and restoration of the disposal areas; and
- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, and/or volume as a principal element. At the conclusion of this remedy, there will be no hazardous substances remaining on the site above health-based levels. However, because the remedial goals will not be attained within five years, the five year review will apply to this remedial action.

William J. Muszynski, P.E.
Acting Regional Administrator

9-29-89
Date

DECISION SUMMARY

RECORD OF DECISION

EWAN PROPERTY (OPERABLE UNIT TWO)

Site Location and Description

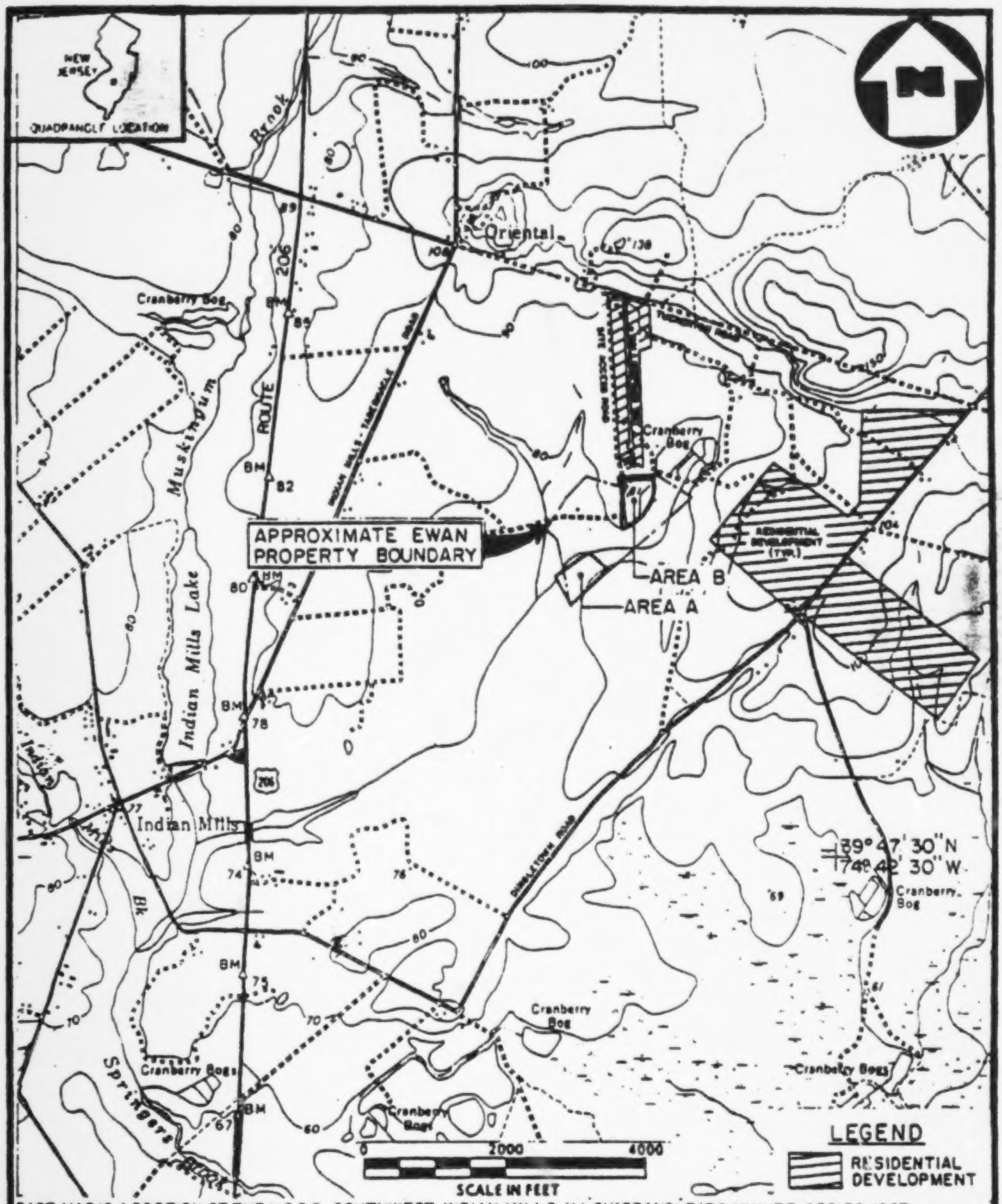
The Ewan Property consists of forty-three heavily wooded acres in Shamong Township, New Jersey. The New Jersey Department of Environmental Protection (NJDEP) has concluded that the site, which includes the contaminated groundwater plume, is located within the Central Pine Barrens portion of the New Jersey Pinelands. The site is approximately 4,000 feet south of Tuckerton Road and 5,000 feet east-northeast of Indian Mills Lake in Shamong Township, New Jersey. Land use within 1.25 miles of the property is generally forests, forested wetlands, agricultural land, and single family residential areas. Wharton State Forest is approximately two miles south of the site. Upper-middle income residential developments are located both to the north and east. The nearest resident is located approximately 1500 feet from the site.

Domestic water within one mile of the site is obtained from individual private wells developed within the Cohansey Sand hydrogeologic unit, a water table aquifer. Domestic sewage is disposed of through individual private septic systems. Area agricultural water usage is dependent upon the water table aquifer. Ground water within the Cohansey Sand has been determined to flow in a southerly direction. The nearest ground water user downgradient from the site is located approximately one mile away.

Two areas of industrial waste disposal were initially studied during the preliminary site investigation, and were the focus of the Remedial Investigation. The two areas were identified as Area A (approximately nine acres) and Area B (approximately five acres). Both Area A and Area B are identified on Figure 1. No indication of industrial waste disposal was encountered in the remaining portions of the property.

The significant findings of the Remedial Investigation and the Operable Unit Two Feasibility Study are noted below:

- Area B was not identified as containing industrial-type wastes. Therefore, Area B will not be addressed by the Superfund program.
- Approximately 4500 cubic yards of source waste material (i.e., drums and heavily contaminated materials) were buried in the four acre tract of Area A (see Figure 2). These materials will be addressed during the Operable Unit One Remedial Action.


NEW JERSEY
QUADRANGLE LOCATION
N
Brook
Oriental
ROUTE 206
206
Cranberry Bog
Muskingum
Indian Mills Lake
Indian Mills
BM
82
78
74
75
67
80
100
130
150
104
69
70
60
61
Cranberry Bog
APPROXIMATE EWAN PROPERTY BOUNDARY
AREA B
AREA A
RESIDENTIAL DEVELOPMENT (TYP.)
39° 47' 30" N
74° 42' 30" W
Bk
Springers Brook
Cranberry Bogs
0
2000
4000
SCALE IN FEET
LEGEND
RESIDENTIAL DEVELOPMENT

BASE MAP IS A PORTION OF THE U.S.G.S. SOUTHWEST INDIAN MILLS, NJ QUADRANGLE (7.5 MINUTE SERIES, 1957, PHOTOINSPECTED 1972, CONTOUR INTERVAL 10 FEET). EWAN PROPERTY LOCATION IS APPROXIMATE.

FIGURE 1

SITE LOCATION MAP
EWAN PROPERTY SITE, SHAMONG TWP., NJ

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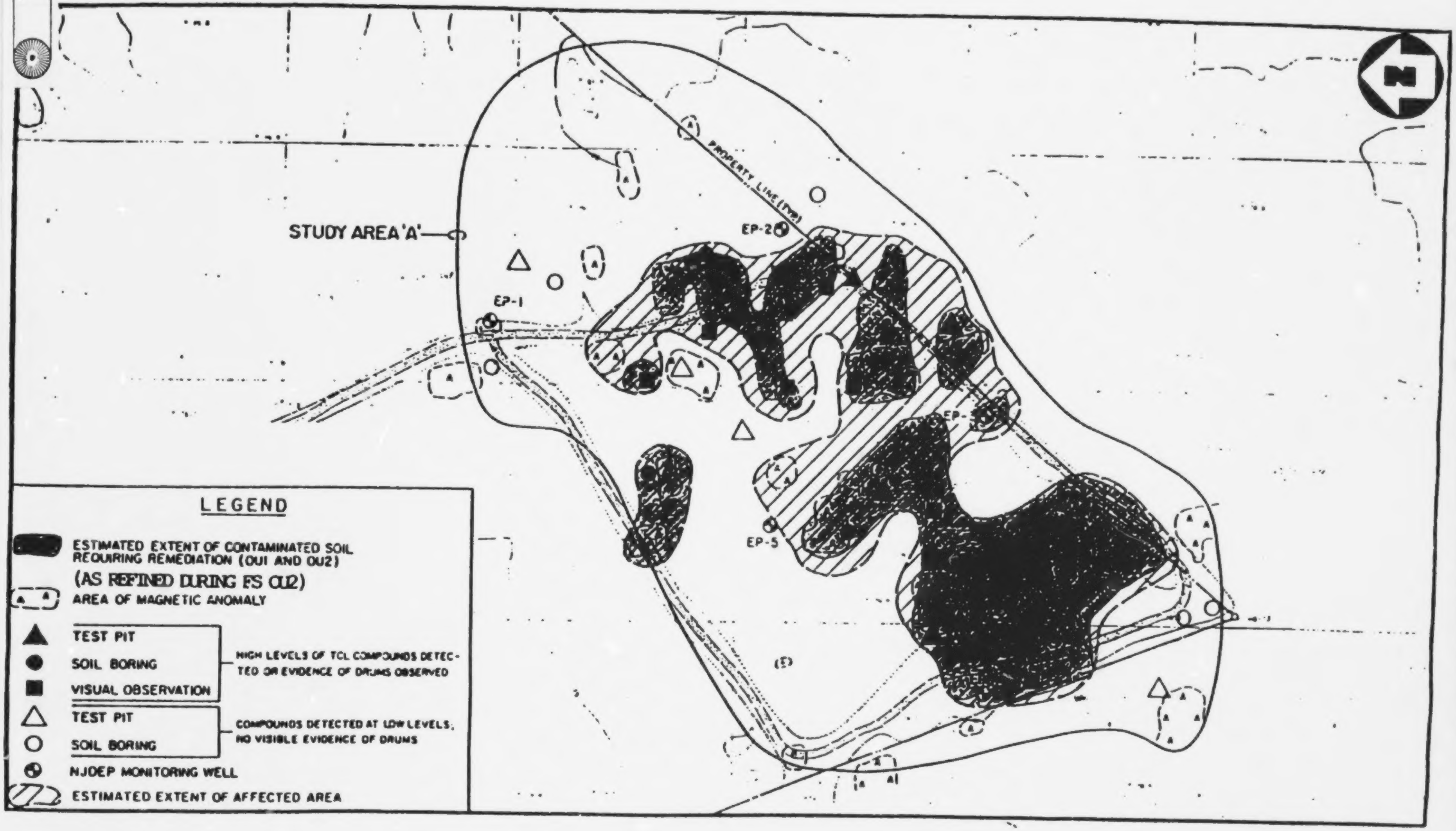
STUDY AREA 'A'
PROPERTY LINE (TYP)
EP-1
EP-2
EP-5
EP-
LEGEND
ESTIMATED EXTENT OF CONTAMINATED SOIL REQUIRING REMEDIATION (OU1 AND OU2)
(AS REFINED DURING FS OU2)
AREA OF MAGNETIC ANOMALY
TEST PIT
SOIL BORING
VISUAL OBSERVATION
HIGH LEVELS OF TCL COMPOUNDS DETECTED OR EVIDENCE OF DRUMS OBSERVED
TEST PIT
SOIL BORING
COMPOUNDS DETECTED AT LOW LEVELS; NO VISIBLE EVIDENCE OF DRUMS
NJDEP MONITORING WELL
ESTIMATED EXTENT OF AFFECTED AREA
0
100
200
SCALE IN FEET

FIGURE 2

APPROXIMATE EXTENT OF CONTAMINATED SOIL
EWAN PROPERTY SITE, SHAMONG TWP., NJ

- The Remedial Investigation had estimated that 29,500 cubic yards of contaminated soil exist within the burial trenches. The Operable Unit Two Feasibility Study further refined this estimate to 22,000 cubic yards of soil which will require treatment during implementation of the Operable Unit Two Remedial Action.

- The principal source contaminants are largely chlorinated aliphatic organic compounds (1,2-dichloroethane, tetrachloroethene, 1,1,1-trichloroethane, methylene chloride, trichloroethene, carbon tetrachloride, 1,1-dichloroethane, chloroform) and aromatic hydrocarbons (benzene, ethylbenzene, naphthalene, xylenes, toluene) as well as lead, barium, copper and chromium.

- The ground water contaminant plume originating from Area A continues to migrate. This plume is contained within the Cohansey Sand aquifer. As presented in various geological references and confirmed during the Remedial Investigation, exposed portions of the Cohansey Sand geologic unit are recharge areas for the aquifer. The sampling of ground water in January, 1989 indicates that the contaminant plume is approximately 760 feet long, 600 feet wide, and 30 feet deep (see Figure 3).

Site History and Enforcement Activities

The United States Environmental Protection Agency (EPA) has notified six potentially responsible parties of their possible liability associated with the hazardous substances at the Ewan Property. These potentially responsible parties are:

Chrysler Motors Corporation

A & B Drum Company

Lightman Drum Company

State Steel Drum Company

Ms. Verna Ewan Donnelly

Mr. Francis Block

EPA has information to show that Mr. Herbert Ewan conducted waste disposal on his property within Area A in 1974 and 1975. His general method of operation was to excavate one trench per truckload of drummed waste. The waste was deposited into the trench and buried.

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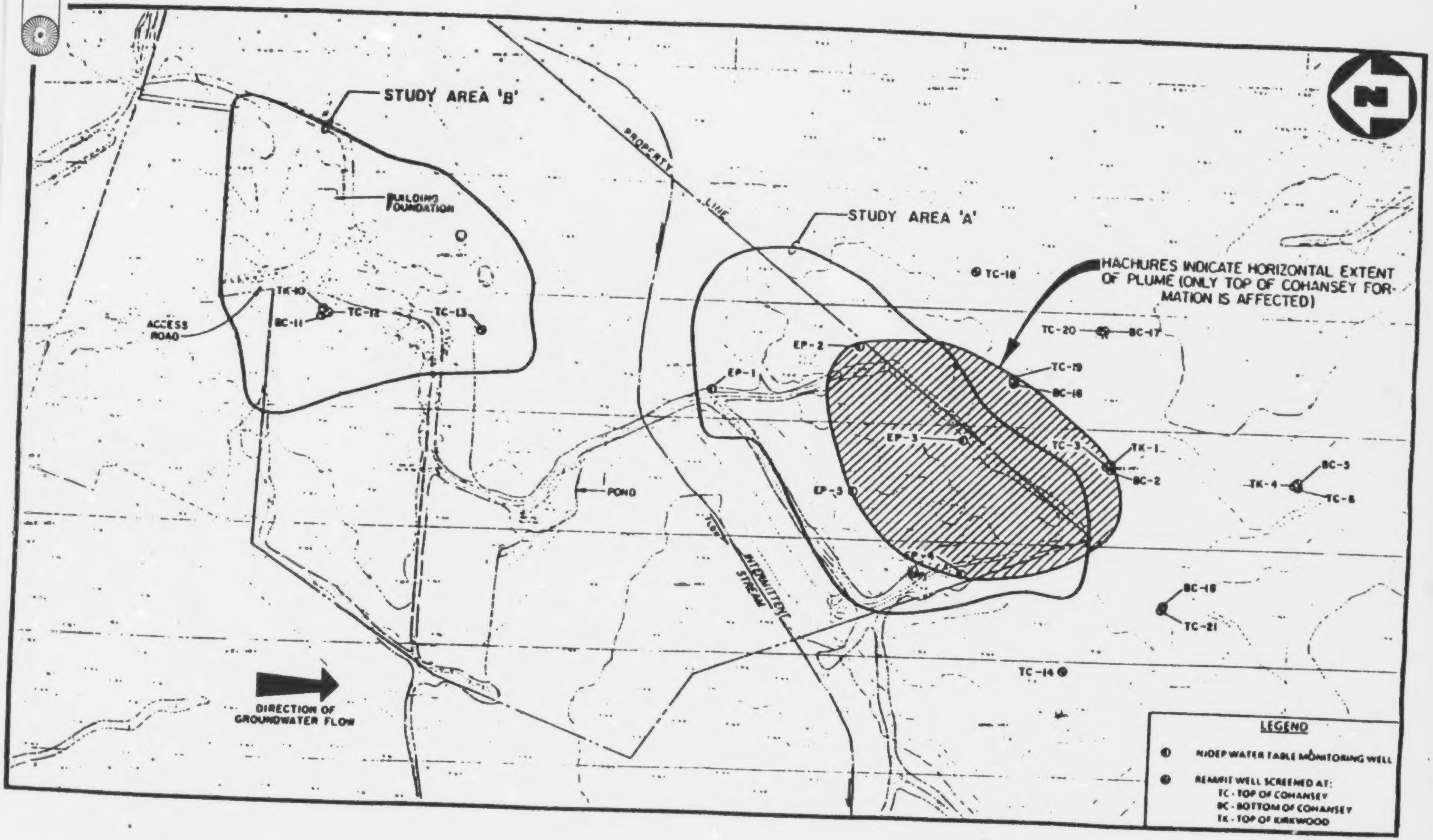
N
STUDY AREA 'B'
BUILDING FOUNDATION
ACCESS ROAD
TK-10
BC-11
TC-12
TC-13
PROPERTY LINE
STUDY AREA 'A'
TC-18
HACHURES INDICATE HORIZONTAL EXTENT OF PLUME (ONLY TOP OF COHANSEY FORMATION IS AFFECTED)
TC-20
BC-17
EP-2
TC-19
BC-16
EP-1
EP-3
TC-3
TK-1
BC-2
TK-4
BC-5
TC-6
POND
INTERMITTENT STREAM
BC-15
TC-21
TC-14
DIRECTION OF GROUNDWATER FLOW
LEGEND
NJDEP WATER TABLE MONITORING WELL
REMFIT WELL SCREENED AT:
TC - TOP OF COHANSEY
BC - BOTTOM OF COHANSEY
TK - TOP OF KIRKWOOD

FIGURE 3

ESTIMATED CONTAMINATED GROUNDWATER PLUME (BASED ON 1989 DATA)
EWAN PROPERTY SITE, SHAMONG TWP., NJ

0 200 400
SCALE IN FEET

Mr. Ewan reportedly tried bulk uncontainerized disposal within Area A. After incompatible wastes were mixed together, there was a small fire on the site. Mr. Ewan did not attempt uncontainerized disposal after that incident. After Mr. Ewan's death, his wife, formerly Ms. Verna Dale Ewan, became the sole owner of the Ewan Property.

In September, 1982 the Burlington County Health Department obtained information that the dumping of possible hazardous waste had occurred at the site.

In 1983, the NJDEP conducted a geophysical survey and installed five monitoring wells in the Cohansey Sand aquifer within Area A. The geophysical survey concluded that a significant magnetic anomaly existed within Area A. Sample results from these monitoring wells indicated the presence of contaminants such as methylene chloride, toluene, chloroform, 2,4-dichlorophenol, n-butylbenzene, o-dichlorobenzene, p-dichlorobenzene, 1,2,4-trichlorobenzene, arsenic, chromium, and lead.

NJDEP further attempted to characterize the site by bulk sampling one drum and collecting soil samples from three areas of apparent spillage. The contaminants detected in these four samples were similar to the chemical compounds detected in the ground water.

EPA performed a Preliminary Assessment/Site Investigation in 1984. As part of this action, EPA conducted more geophysical investigations within Area A including on-site and residential well sampling. The geophysical investigation and on-site monitoring well results confirmed the earlier NJDEP ground water findings. EPA determined that the nearby residential wells were not impacted by on-site contamination.

The Ewan Property was originally proposed for inclusion on the National Priorities List in March, 1985. The site was formally added to the National Priorities List in June, 1986.

EPA began the Remedial Investigation in September, 1986. During these investigation activities, domestic refuse was found in Area B. However, there was no evidence of industrial waste disposal. Therefore, Area B was not addressed further by the Superfund program.

EPA decided to divide the site remediation into two operable units. Operable Unit One was developed to address the treatment of the 4500 cubic yards of source waste. The Operable Unit One Feasibility Study was completed concurrently with the overall Remedial Investigation. Both documents were presented to the public during August, 1988. The Operable Unit One Record of Decision (ROD) was signed in September, 1988.

In December, 1988, Chrysler Motors Corporation, a potentially responsible party, completed the installation of a site security fence around Area A. The action was conducted under the terms of a Consent Order issued by EPA.

EPA is pursuing enforcement actions against potentially responsible parties to conduct the Operable Unit One Remedial Design and Remedial Action.

The Operable Unit Two Feasibility Study was designed to address the remediation of the residually contaminated soils which will remain after the Operable Unit One Remedial Action is implemented and also the treatment of the contaminated ground water.

As part of the Operable Unit Two Feasibility Study, additional ground water and soil samples were taken, and additional geophysical activities were conducted to better refine the contaminated soil volume. The soil samples were also used for a treatability study to examine the potential use of two innovative technologies: soil washing and solidification. The treatability study determined the effectiveness and permanence of these technologies in reducing toxicity, mobility, or volume of contaminants in the residual site soils. This additional study was conducted from January, 1989 to July, 1989.

Highlights of Community Participation

The Operable Unit Two Feasibility Study and the Operable Unit Two Proposed Plan for the Ewan Property were released to the public on August 7, 1989. These documents were made available to the public in both the administrative record of September 13, 1989 and an information repository maintained with Mr. Lynn Heinhold, Shamong Township Clerk, Shamong Township Municipal Building, Vincentown, New Jersey. The notice of availability for these documents was published in the Burlington County Times on August 7, 1989. A public comment period was held from August 7, 1989 through September 11, 1989 (the public comment period was extended from September 6, 1989 to September 11, 1989 in response to a public request). In addition, a public meeting was held on August 17, 1989. At this meeting, representatives from the EPA answered questions about problems at the site and the remedial alternatives under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is a part of this ROD.

This decision document presents the selected remedial action for the Ewan Property, in Shamong, New Jersey, chosen in accordance with the Comprehensive Environmental Responsibility, Liability, and Compensation Act of 1980 (CERCLA) as amended by the Superfund Amendments and Re-Authorization Act of 1986 (SARA), and to the extent applicable, the National Contingency Plan. The decision for this site is based on the administrative record.

Scope and Role of Operable Unit Two

The problems at the Ewan Property site are complex. Therefore, as noted previously, EPA separated the site remediation into two phases or operable units. Operable Unit One was designed to address buried drums and heavily contaminated materials. Operable Unit Two addresses residual contaminated soils and contaminated ground water.

EPA has already selected cleanup remedies for the buried drums and heavily contaminated material. This "source material" is a principal threat at the site because of the possibility of direct contact and the impact of the material on the ground water. The remedies were selected, after a public meeting and a 30-day public comment period, in the Operable Unit One Record of Decision signed on September 29, 1988. The 1988 Record of Decision called for excavation and off-site thermal destruction and/or treatment of approximately 4500 cubic yards of source material (i.e., buried drums and heavily contaminated materials). The source material will be separated into materials which are appropriate for thermal destruction and materials which are not appropriate for thermal destruction. Each source material classification will be treated accordingly.

Operable Unit Two will address the remediation of the 22,000 cubic yards of less contaminated soils and the ground water contaminant plume remaining after the completion of the Operable Unit One Remedial Action. The residual contaminated soil is a principal threat at the site because of direct contact and the impact of the soil contaminants on ground water. The contaminated ground water was also determined to be a principal threat at this site because of the future potential for direct ingestion of contamination through drinking water wells.

Summary of Site Characteristics

The Remedial Investigation established that approximately 4500 cubic yards of source waste material (i.e., drums and heavily contaminated materials) were buried in the five acre tract of Area A. These materials present a threat to public health and the environment and will be addressed during the Operable Unit One Remedial Action. After review of site records and waste analysis, Resource Conservation and Recovery Act (RCRA) listed wastes were not identified.

An estimated 22,000 cubic yards of residually contaminated soil may exist on-site following the Operable Unit One Remedial Action.

The primary source contaminants are largely chlorinated aliphatic organic compounds (1,2-dichloroethane, tetrachloroethene, 1,1,1-trichloroethane, methylene chloride, trichloroethene, carbon tetrachloride, 1,1-dichloroethane, chloroform) and aromatic hydrocarbons (benzene, ethylbenzene, naphthalene, xylenes, toluene) as well as lead, barium, copper and chromium.

The ground water contaminant plume originating from Area A continues to migrate. The Operable Unit Two Feasibility Study ground water sampling conducted in January, 1989 indicated that this contaminant plume was approximately 760 feet long, 600 feet wide, and 30 feet deep.

Summary of Site Risks

The Operable Unit Two Feasibility Study concluded that actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other active measures considered, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Human Health Risks

During the Remedial Investigation, an analysis was conducted to estimate the health or environmental problems that could result if the soil contamination and the ground water at the Ewan Property site were not cleaned up. This analysis is commonly referred to as a baseline risk assessment. In conducting this assessment, the focus was on the health effects that could result from direct exposure to the contaminants due to the soil coming into contact with the skin, or from direct ingestion of the soil by a child playing in the area, or by direct ingestion of the ground water. The Remedial Investigation contains the complete risk analysis for the Ewan Property site.

Cancer potency factors have been developed by EPA's Carcinogenic Assessment Group for estimating lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. Cancer potency factors, which are expressed in units of (mg/kg-day)$^{-1}$, are multiplied by the estimated intake of a potential carcinogen in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper-bound" reflects the conservative estimate of the risks calculated from the cancer potency factor. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied.

Reference doses have been developed by EPA for indicating the potential adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. Reference doses, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the reference dose. Reference doses are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the reference doses will not underestimate the potential for adverse noncarcinogenic effects to occur.

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1x10^{-6} or 1E-6). An excess lifetime cancer risk of 1x10^{-6} indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as a hazard quotient (or the ratio of the estimated intake derived from the contaminant's reference dose). By adding the hazard quotients for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index can be generated. The Hazard Index provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The major public health risk posed by the Ewan Property is the potential ingestion of contaminated ground water. The ground water on-site is contaminated with toluene, methylene chloride, ethylbenzene, chromium, lead, and arsenic. EPA's sampling of the ground water at the site found that the organic contamination ranged from non-detectable concentrations to 5300 parts per billion. Inorganic contaminant concentrations ranged from 1 part per billion to 1800 parts per billion. This concentration level is associated with an excess lifetime cancer risk of 10^{-3}. This means that if no cleanup action is taken by EPA, one additional person per one thousand would have a chance of contracting cancer as a result of exposure to the contaminated ground water. The total Hazard Index for ingestion of the on-site contaminated ground water is 1.9, where Hazard Index values below 1.0 are considered as no significant noncarcinogenic risks. At the present time, no one uses the contaminated ground water for drinking or other purposes. This risk analysis was performed to evaluate potential site risks associated with potential domestic use of the ground water.

Environmental Health Risks

The environmental risk present at the Ewan Property site is the continued degradation of ground water in the New Jersey Pinelands (an especially sensitive ecosystem). EPA proposes to remediate soil contamination and ground water contamination to levels which will restore this valued natural resource.

EPA's sampling of the lesser contaminated soils shows that without remediation the contaminant concentrations present will allow continued leaching into the ground water, resulting in concentrations in the ground water above cleanup goals. The Operable Unit Two Feasibility Study contains a complete analysis of soil remedial action goals to prevent ground water degradation.

Description of Remedial Alternatives

The alternatives analyzed for Operable Unit Two are presented below. These alternatives are numbered to correspond with those in the Operable Unit Two Feasibility Study report.

Numerous remedial technologies were initially screened on the basis of effectiveness, implementability, and cost. Following the remedial technology screening, eight remedial alternatives for Operable Unit Two were retained for consideration.

The alternatives for the ground water cleanup were the following:

- Alternative 1G: No Action with Administrative Controls.
- Alternative 4G: Collection and Ten Year Treatment with Reverse Osmosis and On-Site Reinjection of Ground Water.
- Alternative 4Ga: Collection and Ten Year Treatment with On-Site Reinjection of Ground Water.
- Alternative 4Gb: Collection and Three Year Treatment with On-site Reinjection of Ground Water.

The alternatives for the soil cleanup were the following:

- Alternative 1S: No Action with Administrative Controls.
- Alternative 3S: Excavation Followed by Solvent Extraction/ Solidification.
- Alternative 4S: Excavation Followed by Solvent Extraction/ Soil Washing.
- Alternative 5S: Off-site Incineration of Less Contaminated Soils.

Ground Water Remedial Alternatives

The NJDEP has determined that the site, which includes the contaminated groundwater plume, is located within the Central Pine Barrens portion of the New Jersey Pinelands. As a result of ground water sampling in 1989, plume dimensions are estimated to be 760 feet long by 600 feet wide by 30 feet deep. The "Draft Guidelines for Ground Water Classification under the EPA Ground Water Protection Strategy" identifies the on-site Cohansey Sand aquifer as IIA because this is a potential drinking water source. The ground water remedial alternatives were conceptually designed to remediate the contaminated ground water plume.

Alternative 1G:
No Action With Administrative Controls

Estimated Capital Cost:	$0
Estimated Annual Operation and Maintenance (O&M) Costs:	$0
Estimated Present Worth:	$0
Estimated Time to Implement:	None

The National Contingency Plan requires that the "No Action" alternative be evaluated at every site to establish a baseline for comparison. Under this alternative, EPA would take no further action at the site to prevent exposure to ground water contamination. Instead, the contaminated ground water plume would be allowed to continue to migrate off-site. EPA has predicted that the nearest ground water user (approximately 2000 feet down gradient of the site) will be impacted in approximately 22 years. Administrative controls would have to be enacted to prevent use of the contaminated ground water.

Alternative 4G:
Collection and Ten Year Treatment With Reverse Osmosis and On-Site Reinjection of Ground Water

Estimated Capital Cost:	$11,000,000
Estimated Annual O&M Costs:	$ 4,100,000
Estimated Present Worth:	$42,300,000
Estimated Time to Implement:	10 years

This alternative utilizes an on-site ground water treatment system. Contaminated ground water would be removed from the aquifer by on-site extraction wells. The water would then be passed through a succession of treatment steps which could include the following processes:

- Chemical precipitation for metals and solids removal,
- Sedimentation to further remove metals and solids,
- Air stripping and activated sludge, ultraviolet light or ozone addition to destroy or alter organic materials,
- Filtration to remove solids,
- Activated carbon adsorption to collect remaining organic compounds,
- Reverse osmosis to remove residual solids and biochemical oxygen demand

The ground water will be reinjected within the contaminated ground water plume following treatment. The remedial goal of this alternative is to attain the Maximum Contaminant Levels (MCLs) established pursuant to the Federal Safe Drinking Water Act, and the State of New Jersey Safe Drinking Water Act; and New Jersey Administrative Code Title 7, Chapter 9, Subchapter 6, Section 6, Subsection (a) (N.J.A.C. 7:9-6.6(a)) criteria in the treated effluent. The MCLs were developed to protect human health and the N.J.A.C. 7:9-6.6 (a) criteria were developed to protect the ground water in the Central Pine Barrens region of the New Jersey Pinelands.

The ten year time term is an estimation used for costing purposes. The objective of this alternative is to attain the previously discussed regulatory goal.

Alternative 4Ga:
Collection and Ten Year Treatment With On-Site Reinjection of Ground Water

Estimated Capital Cost:	$ 6,700,000
Estimated Annual O&M Costs:	$ 1,910,000
Estimated Present Worth:	$21,400,000
Estimated Time to Implement:	10 years

This alternative is identical to Alternative 4G, except that Reverse Osmosis is not included. The final remedial goal is to attain the published N.J.A.C. 7:9-6.6(a) criteria, and the MCLs established pursuant to the Federal Safe Drinking Water Act and State Safe Drinking Water Act in the ground water at the end of the remediation. The N.J.A.C. 7:9-6.6(a) standards were developed to protect the ground water in the Central Pine Barrens region of the New Jersey Pinelands. The Federal and State Safe Drinking Act MCLs were developed to provide protection of drinking water supplies.

The treatment process to remove metals will cause an increase in the level of total dissolved solids (TDS) in the effluent above the standard established in N.J.A.C. 7:9-6.6(a). However, this higher level of TDS is expected to be present only while the metals precipitation unit is in operation. After treatment to remove metals has been completed and the operation of the precipitation unit has been reduced or ceased, the concentration of TDS in the aquifer is expected to revert to low levels consistent with natural ground water conditions.

The ten year term is an estimation used for costing purposes. The objective of this alternative is to attain the previously discussed regulatory goal.

Alternative 4Gb:
Collection and Three Year Treatment With On-Site Reinjection of Ground Water

Estimated Capital Cost:	$ 6,700,000
Estimated Annual O&M Costs:	$ 1,910,000
Estimated Present Worth:	$11,900,000
Estimated Time to Implement:	3 years

This remedial alternative is operationally identical to Alternative 4Ga. The final remedial goal of the ground water remedy is to attain the MCLs established pursuant to the Federal and State Safe Drinking Water Acts.

The objective of this alternative is to attain the previously discussed regulatory goal.

Soil Remedial Alternatives

The goal of the soil remediation and redeposition alternatives will be to maintain the ground water remedial goals. This will be accomplished by removing the soil contaminants to concentrations which will not permit a leachate to pollute the ground water above the specified ground water remedial objectives.

Alternative 1S:
No Action With Administration Controls

Estimated Capital Cost:	$0
Estimated Annual O&M Costs:	$0
Estimated Present Worth:	$0
Estimated Time to Implement	None

As stated in the No Action alternative for ground water above, the no action alternative is evaluated as a baseline for comparison. Under this alternative, no further action would be taken to clean up the residual soil at the site. Instead, administrative controls would be instituted to prevent contact with the contaminated soils.

Alternative 3S:
Excavation Followed by Solvent Extraction/Solidification

Estimated Capital Cost:	$15,400,000
Estimated Annual O&M Costs:	$ 43,200
Estimated Present Worth:	$15,800,000
Estimated Time to Implement:	2 years

EPA conducted treatability studies for both solvent extraction and solidification. The solvent extraction process readily removed most organic contaminants in the soil. Inorganic contaminants which were not removed from the soil became leachable. The results of the solidification tests indicated that semi-volatile and inorganic contaminants would continue to leach at rates which would cause the site ground water to remain contaminated above the Operable Unit Two remedial goals.

This remedial alternative proposes to excavate approximately 22,000 cubic yards of contaminated soils and treat them on-site by extracting organic contaminants in the soil using solvent extraction, and then chemically to stabilize any remaining soil contaminants through solidification. The solvent used for solvent extraction can be recycled for a time. After the solvent has become unusable, it would be sent off-site for treatment and/or disposal. It is expected that the solvent extraction process will reduce the organic contamination in the soil to concentrations which will not permit degradation of the ground water.

Some soil contaminants, such as inorganics which will not extract easily from soil, may remain after solvent extraction. Further studies would have to indicate the degree to which the soil would have to be solidified to bind these contaminants into the soil matrix so they can not leach into the ground water. The treated soil may qualify as clean fill as defined by the State Solid Waste regulations.

Once the soil is treated to the cleanup goals, it will be redeposited on-site as clean fill. The site would then be regraded and revegetated.

Alternative 4S:
Excavation Followed by Solvent Extraction/Soil Washing

Estimated Capital Cost:	$13,850,000
Estimated Annual O&M Costs:	$ 0
Estimated Present Worth:	$13,850,000
Estimated Time to Implement:	2 years

Under this remedial alternative, the contaminated soil will be excavated and treated on-site. This process involves placing the soil into a mobile soil washer and removing soil contaminants by solvent extraction. EPA's treatability study results for soil extraction indicate that organic contaminants can be readily removed from the soil. The spent solvent will then be sent off-site for treatment and disposal.

Following solvent extraction, the soils will be rinsed with water to remove inorganic contaminants. The treatability study results indicate that further refinement of this technology can achieve the remedial goals. Spent wash water will be treated in the on-site ground water treatment system.

It is expected that the treatment of the soil under this alternative will result in soil that meets the definition of clean fill under the New Jersey Solid Waste Regulations. After attaining the cleanup goals, the soil will be redeposited on-site as clean fill. Furthermore, any leachate which may occur from water percolation through the soils will not deteriorate ground water quality above N.J.A.C. 7:9-6.6(a) criteria, or MCLs under the Federal and State Safe Drinking Water Acts. Following the soil remediation, the site will be regraded and revegetated.

Alternative 5S:
Off-Site Incineration of Less Contaminated Soils

Estimated Capital Cost:	$67,700,000
Estimated Annual O&M Costs:	$ 0
Estimated Present Worth:	$67,700,000
Estimated Time to Implement:	2 years

Under this alternative, the 22,000 cubic yards of contaminated soil would be excavated, transported and treated in an off-site incinerator. The thermal destruction process would address the organic contaminants in the soil. The excavation process would remove the contaminated soil from the site, requiring no long-term management controls. The off-site incinerator would comply with technical standards for incinerators. The resulting ash would be properly handled and disposed of by the operators of the incinerator. The facility, which must be permitted under the Resource Conservation and Recovery Act, must also be in compliance with the Superfund off-site policy before waste could be transported there.

Summary of the Comparative Analysis of Alternatives

In accordance with the National Contingency Plan, a detailed analysis of each remedial alternative is conducted with respect to each of nine detailed evaluation criteria. All selected remedies must at least attain the Threshold Criteria. The selected remedy should provide the best trade-offs among the Primary Balancing Criteria. The Modifying Criteria were evaluated following the public comment period.

Threshold Criteria

- Overall Protectiveness of Human Health and the Environment - This criterion evaluates the adequacy of protection that the remedy provides while describing how risks are eliminated, reduced or controlled through treatment, engineering controls, and/or institutional controls.

- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - This criterion addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes and/or provide grounds for invoking a waiver.

Primary Balancing Criteria

- Reduction of Toxicity, Mobility or Volume (TMV) - This criterion addresses the anticipated treatment performance of the remedy.

- Short-Term Effectiveness - This criterion addresses the period of time required to achieve remedial goals and the risks to human health and the environment during the remedial action.

- Long-Term Effectiveness and Permanence - This criterion evaluates the magnitude of residual risk and the ability of the remedy to maintain reliable protection of human health and the environment over time once remedial goals have been attained.

- Implementability - This criterion examines the technical and administrative feasibility of executing a remedy, including the availability of materials and services needed to implement the chosen solution.

- Cost - This criterion includes the capital and operation and maintenance costs of the remedy.

Modifying Criteria

- State Acceptance - This criterion indicates whether, based on its review of the Operable Unit Two Feasibility Study and Operable Unit Two Proposed Plan, the State of New Jersey concurs with, opposes, or has no comment on the preferred alternative.

- Community Acceptance - This criterion evaluates the reaction of the public to the remedial alternatives and EPA's Proposed Plan. Comments received during the public comment period and EPA's responses to those comments are summarized in the Responsiveness Summary attached to this document.

Ground Water Remedial Alternatives

The ground water remedial alternatives were evaluated to determine their effectiveness in remediating the site ground water contaminant plume. The ground water contaminant plume originating from Area A continues to migrate. This plume is contained within the Cohansey Sand aquifer. The Cohansey Sand is a water table aquifer on-site. As presented in various geological references and confirmed during the Remedial Investigation, exposed portions of the Cohansey Sand geologic unit are recharge areas for the aquifer. As a result of the 1989 ground water sampling, plume dimensions are estimated to be 760 feet long by 600 feet wide by 30 feet deep.

Analysis

Overall Protection. All of the alternatives, with the exception of the "No Action" alternative, would provide adequate protection of human health by eliminating, reducing or controlling risk through treatment of the ground water. The preferred alternative, 4Ga, would attempt to remediate the ground water to the more stringent standards that have been developed for the protection of the Central Pine Barrens' unique ecosystem. Alternative 4G involves adding a treatment unit to achieve additional guidelines proposed by the NJDEP.

Because the "No Action" alternative is not protective of human health and the environment, it is not considered further in this analysis as an option for this site.

Compliance with ARARs. The applicable or relevant and appropriate requirements under Federal and State environmental laws for ground water at the site are contained in N.J.A.C. 7:9-6.6(a) (standards for the ground water of the Central Pine Barrens Region of the New Jersey Pinelands) and the MCLs under the Federal and State Safe Drinking Water Acts (Table 1). Alternative 4Gb would attain MCLs but would not meet the requirements of N.J.A.C. 7:9-6.6(a).

Alternative 4Ga would meet all of the ARAR standards, although the concentration of TDS would be temporarily elevated by the metals removal treatment process. The increased level of TDS would be a short-term condition that would not violate the ARAR, as the TDS level is expected to return to an acceptable concentration when the cleanup is completed. Further, since the plume would be contained during the remedial action, the TDS levels would not escape the extraction/treatment/reinjection system. It is anticipated that the N.J.A.C. 7:9-6.6(a) criteria and the MCLs under the Federal and State Safe Drinking Water Acts would be attained within the plume prior to the completion of the Operable Unit Two Remedial Action.

Alternative 4G would meet all of the ARARs and would utilize additional treatment, reverse osmosis, to prevent the concentration of TDS in the effluent from temporarily exceeding the relevant N.J.A.C. 7:9-6.6(a) standard. Alternative 4G would also attain a list of additional goals proposed by NJDEP.

Long-term Effectiveness and Permanence. Alternatives 4G, 4Ga and 4Gb for ground water would reach and maintain acceptable ground water cleanup levels. These alternatives were developed to attain different levels of ground water cleanup. Alternative 4Ga, the preferred alternative, is designed to reach the cleanup goals at the end of the remedial action. The success of all of these alternatives depends upon the removal of the originating source, the contaminated soil. Since the contaminants would be removed, rather than controlled, this represents a permanent remedy.

Reduction of Toxicity, Mobility or Volume of Contaminants. The three ground water treatment alternatives would reduce the toxicity and volume of contaminated ground water through the use of treatment technologies that remove contaminants from the ground water. Alternative 4G would treat the site ground water contaminants to the remedial goals at the point of discharge. Alternative 4Ga would attain the remedial goals in the ground water plume at the end of the remedial action. Alternative 4Gb will attain Federal and State Safe Drinking Water Acts MCLs in the ground water plume at the end of the remedial action. The remedial objectives are protective of human health and the environment.

TABLE 1

Ground Water Remedial Objectives for the Operable Unit Two Remediation of the Ewan Property

Contaminants	Goals (ug/l)	Source
Aldrin/Dieldrin	0.003	1
Ammonia	50	1
Arsenic	50	3
Barium	1000	1
Benzene	1	2
Benzidine	0.1	1
Biological Oxygen Demand	3	1
Cadmium	10	1
Carbon tetrachloride	2	2
Chlordane	0.5	2
Chlorobenzene	4	2
Chloride	10,000	1
Chromium	50	1
Coliform Bacteria	40 CFR 141	
Color	1 NTU	3
Copper	50	1
Corrosivity	Non-Corrosive	3
Cyanide	200	1
DDT and metabolites	0.001	1
m-dichlorobenzene	600	1
p-dichlorobenzene	75	3
o-dichlorobenzene	600	3
1,2-dichloroethane	2	2
1,1-dichloroethylene	2	2
trans-1,2-dichloroethylene	10	2
2,4-dichlorophenoxyacetic acid	100	3
Ethylbenzene	700	3
Endrin	0.004	1
Fluoride	40 CFR 141	
Foaming Agents	50	3
Gross alpha activity	15 pCi/l[4]	3
Hydrogen sulfide	50	3
Iron	300	3
Lead	50	3
Lindane	4	3
Manganese	50	3
Mercury	2	3

TABLE 1 (continued)

Ground Water Remedial Objectives for the Operable Unit Two Remediation of the Ewan Property (continued)

Contaminant	Goals (ug/l)	Source
Methoxychlor	100	3
Methylene chloride	2	2
Nickel	13.4	2
Nitrate-nitrogen	2000	1
Odor	3 Threshold Odor Number	3
pH	4.2-5.8	1
Phenols	300	1
Polychlorinated biphenyls	0.001	1
Phosphate	700	1
Radionuclides	40 CFR 141	
Radium	5	3
Selenium	10	3
Silver	50	3
Sodium	10	1
Strontium	8 pCi/l[4]	3
Sulfate	15,000	1
2,4,5-TP Silvex	10	3
Tetrachloroethylene	1	2
Toluene	2000	3
Total Dissolved Solids	100	1
Toxaphene	5	3
Trichlorobenzene	8	2
Trichloroethylene	1	2
Trihalomethanes	100	3
Tritium	20 nCi/l[5]	3
Turbidity	40 CFR 141	
1,1,1-trichloroethane	26	2
Vinyl chloride	2	3
Xylenes	44	2
Zinc	5000	3

1). N.J.A.C. 7:9-6.6(a).
2). N.J.A.C. 7:10-5, N.J.A.C. 7:10-7, A-280.
3). 40 CFR 141, 40 CFR 143.
4). Picocuries per liter.
5). Nanocuries per liter.

Short-term Effectiveness. A short-term increase in the level of total dissolved solids in the treated effluent is expected from the metals treatment system of Alternative 4Ga. However, Alternative 4Ga is expected to attain the ground water cleanup goals by the end of the remedial action. Alternative 4Gb will not attain the N.J.A.C. 7:9-6.6(a) total dissolved solids standard. Total dissolved solids are not associated with health risks and any short-term impacts on the environment during the remediation can be mitigated through proper monitoring and engineering.

Alternative 4G utilizes an additional treatment unit to reduce the concentration of TDS in the effluent to the N.J.A.C. 7:9-6.6(a) standard.

Implementability. Alternatives 4G, 4Ga and 4Gb are expected to be technically and administratively feasible. The alternatives utilize water treatment equipment that is readily available, reliable and are proven technologies.

Cost. Alternative 4Ga would be protective of public health and the environment, and would attain all ARARs in the long-term at a significantly lower cost than Alternative 4G. Alternative 4Gb is the least expensive remedy. However, it cannot attain the remedial goals. Table 2 provides a summary of the present worth costs associated with the ground water remedies.

State Acceptance. The NJDEP was directly involved in the planning and oversight of the Remedial Investigation and Feasibility Study. The State has accepted the remedy selected in this Record of Decision, but has not concurred with the remedial goals for cleanup of the ground water. For example, the State would prefer that the selected treatment process be operated for a considerably longer period of time. This opinion is expressed in correspondence from the State to EPA, which is included in the Administrative Record for the Ewan Property site.

Community Acceptance. The objective of the community relations activities was to inform the public about the work being performed at this site and to seek input from the public on the remedy. Issues raised during the public comment period and at the public meeting are addressed in the Responsiveness Summary section of this ROD.

TABLE 2

Summary of Present Worth Costs for Operable Unit Two Ground Water Remedies of the Ewan Property

Alternative	Total Present Worth Costs* ($)
1G - No Action With Administrative Controls	0
4G - Collection and Ten Year Treatment With Reverse Osmosis and On-Site Reinjection of Ground Water	42,300,000
4Ga - Collection and Ten Year Treatment With On-Site Reinjection of Ground Water	21,400,000
4Gb - Collection and Three Year Treatment With On-Site Reinjection of Ground Water	11,900,000

* Total present worth costs are estimates.

Soil Alternatives

The soil remedial alternatives evaluated the treatment of the estimated 22,000 cubic yards of contaminated soil which will remain on-site following the implementation of the Operable Unit One Remedial Action.

Analysis

Overall Protection. All of the soil treatment alternatives could provide adequate protection of human health and the environment, (if implemented in conjunction with a remedial action for ground water) by eliminating, reducing or controlling risk through treatment or engineering controls. The preferred alternative would remove the contaminants from the soil through solvent extraction and soil washing to levels which would be protective of human health and the environment.

Similar to the analysis for the ground water alternatives, the "No Action" alternative for the soil will not be further considered in this analysis since it is not protective of human health and the environment.

Compliance with ARARs. All of the alternatives could meet the applicable or relevant and appropriate requirements of Federal and State environmental laws. Treatability studies for the preferred alternative demonstrated that treating the soils through solvent extraction and soil washing would reduce the contaminants in the soil to levels acceptable for redeposition at the site.

Long-term Effectiveness and Permanence. All of the active alternatives are considered effective and permanent. The preferred alternative, 4S, would remove the contaminants from the soil so that it can be redeposited on-site without further action. While Alternative 3S would remove most of the contaminants from the soil through solvent extraction, some of the contaminants would remain. These contaminants would be stabilized through the solidification process, which would bind the inorganic contaminants to the solid material. Alternative 5S would remove and treat all waste in a permitted, off-site incinerator.

Reduction of Toxicity, Mobility or Volume of the Contaminants. All of the active alternatives would reduce the toxicity, mobility or volume of the contaminants through treatment or stabilization processes. Alternative 3S would remove organic soil contaminants by solvent extraction. The mobility of the remaining inorganic contaminants could be retarded by extensive solidification. Alternative 4S would remove all of the soil contaminants by solvent extraction and soil washing. Alternative 5S would remove the soil from the site.

Short-term Effectiveness. Each soil treatment alternative is expected to require two years of remedial activity to achieve the site cleanup goals. All of the active treatment alternatives include excavation. There are some minor short-term risks of exposure of volatile organics during the excavation, but these can be mitigated through proper monitoring and engineering. Alternative 5S, Off-site Incineration, requires the transportation of the 22,000 cubic yards of contaminated soil from the site. There are also some minor short-term risks to the community associated with the transportation of contaminated soils to the incineration facility. These risks can also be mitigated.

Implementability. All of the alternatives are considered implementable. Treatability studies for the preferred alternative, Solvent Extraction/Soil Washing, have shown that the cleanup goals for the soils can be attained, allowing the soil to be redeposited on-site.

Cost. The present-worth cost of the preferred alternative is estimated at $13,850,000. The highest cost alternative is Alternative 5S, Off-site Incineration, at $67,700,000. Table 3 provides a summary of the present worth costs of the soil remedies.

State Acceptance. The NJDEP was directly involved in the planning and oversight of the Remedial Investigation and Feasibility Study. The State has accepted the remedy selected in this Record of Decision for soil remediation.

Community Acceptance. The objective of the community relations activities was to inform the public about the work being performed at this site and to seek input from the public on the remedy. Issues raised during the public comment period and at the public meeting are addressed in the Responsiveness Summary section of this ROD.

TABLE 3

Summary of Present Worth Costs for Operable Unit Two Soil Remedies of the Ewan Property

Alternative	Total Present Worth Costs* ($)
1S - No Action With Administrative Controls	0
3S - Excavation Followed by Solvent Extraction/ Solidification	15,800,000
4S - Excavation Followed by Solvent Extraction/ Soil Washing	13,850,000
5S - Off-Site Incineration of Less Contaminated Soils	67,700,000

* Total present worth costs are estimates.

Selected Remedy

The selected alternative for cleanup of the ground water at the Ewan Property site is Alternative 4Ga - Collection and Ten Year Treatment with On-Site Reinjection of Ground Water. This alternative was chosen because the site, which includes the contaminated ground water plume, is defined by NJDEP as being in the Central Pine Barrens Region of the New Jersey Pinelands. The cleanup goals for this action are the published N.J.A.C. 7:9-6.6(a) criteria and MCLs established pursuant to the Federal and State Safe Drinking Water Acts. N.J.A.C. 7:9-6.6(a) was developed to preserve and restore the conditions of the Central Pine Barrens ground water. The MCLs of the Federal and State Safe Drinking Water Acts were developed to protect public health. The ground water contaminant plume will be contained by the extraction/treatment/reinjection system. It is the goal of this ground water remedy to attain N.J.A.C. 7:9-6.6(a) criteria, Federal MCLs, and State MCLs within the contaminated portion of the Cohansey Sand aquifer prior to the completion of the Operable Unit Two Remedial Action. This alternative also complies with the EPA Ground Water Protection Strategy.

The selected alternative for cleanup of contaminated soil at the Ewan Property is Alternative 4S - Excavation Followed by Solvent Extraction/Soil Washing. This alternative would be applied to the estimated 22,000 cubic yards of contaminated soil remaining after the Operable Unit One Remedial Action. The contaminated soil would be treated to concentrations that would achieve the ground water remedial goals.

A detailed cost analysis of the selected remedies is presented in Table 4 and Table 5.

Several Pre-Design Studies will have to be conducted as part of the Operable Unit Two Remedial Design. These studies should include:

- A wetlands assessment to delineate the nearby wetlands, identify impacts to the wetlands and procedures to reduce any impacts,
- An emissions study to fulfill NJDEP permit equivalency requirements and to develop contingency plans to reduce the possibility of potential impacts on nearby residents caused by the operation of the selected remedies,
- Conduct further treatability studies to optimize operations for the selected remedy,

TABLE 4

Cost Summary of Operable Unit Two
Selected Alternative for Ground Water Remediation

Alternative 4Ga*
Collection and Ten Year Treatment with On-Site Reinjection of Ground Water

Capital Costs	**Estimated Costs**
Construction (Equipment, piping, instrumentation, foundations, structural, electrical)	$6,623454
Administrative Contingency	$456,790
General Contingency	$913,580
Engineering Contingency	$685,185
	$6,623,454
Operation and Maintenance (Energy, maintenance, chemicals, operators, carbon, ultraviolet or ozone generation)	$1,903,980
Total Operation and Maintenance Through Ten Years	$19,039,800
Total Present Worth (with 5% annual discount rate)	$21,328,000

* Costs reflect the more expensive physical waste water treatment processes rather than the less expensive biological treatment processes.

TABLE 5

Cost Summary of Operable Unit Two
Selected Alternative for Soil Remediation

Alternative 4S
Excavation Followed by Solvent Extraction/ Soil Washing

Capital Costs	Estimated Costs
Excavation (22,000 cubic yards)	$50,600
Soil Extraction/Soil Washing	$6,803,600
Reclamation	$297,635
Health and Safety	$960,948
Labor, Materials, Subcontractor	$714,932
Indirect costs and profit	$907,811
Administrative Contingency	$973,553
General Contingency	$1,947,105
Engineering Contingency	$1,168,263
Total Cost	$13,824,447

- Conduct further studies to refine the site specific remedial soil objectives (soil goals will not deteriorate ground water beneath the site above ground water remedial objectives).

Perimeter monitoring will be conducted from the completion of Operable Unit One to the completion of Operable Unit Two. This monitoring program will minimize the potential of off-site impacts. Contingency plans will be developed to maintain protection of human health and the environment.

Following completion of the remedial actions, all areas affected by both operable units will be recontoured, restored and revegetated to their original conditions.

Statutory Determinations

EPA's selection of Alternatives 4Ga and 4S comply with the rerequirements of Section 121 of CERCLA as amended by SARA. Both alternatives are protective of human health and the environment. Together, they would achieve substantial risk reduction through treatment of the principal threat remaining at the site (i.e., contaminated ground water and residual contaminated soil). Alternative 4Ga is expected to meet the cleanup goals for the preservation of the Central Pine Barrens. Alternative 4S reduces the risk associated with the contaminated soils through a technology that has been shown to be technically feasible for this site. Implementation of Alternative 4S would remove the remaining source of ground water contamination present in the on-site soils.

The ARARs identified for the ground water remediation are those published in N.J.A.C. 7:9-6.6(a) and the MCLs under both the Federal and State Safe Drinking Water Acts. The point of compliance for this ground water remedy is immediately beneath the site. Alternative 4Ga is anticipated to achieve these concentrations by the end of the remedial action. After completion of Alternative 4S, the soil will not leach contaminants into the ground water above the specified ARAR levels.

EPA has planned to thermally destroy spent solvents produced during the implementation of Alternative 4S. This disposal procedure will comply with the RCRA Land Disposal Restrictions (LDRs). This remediation will comply with all applicable RCRA requirements.

If the source waste is determined to be RCRA regulated waste, then all remedial activities will comply with all applicable RCRA regulations.

In any event, all off-site activities will comply with the joint RCRA/CERCLA Off-Site Policy.

EPA will conduct a permit equivalency process to fulfill the requirements of the promulgated NJDEP air pollution regulations.

All portions of the site affected by both operable unit remedial actions will be restored, recontoured, and revegetated to their original conditions. The site restoration will be in compliance with the Wetlands Protection Act and the Farmland Preservation Act.

Alternative 4Ga is considered cost-effective since it will achieve the ground water goals at approximately half the cost of Alternative 4G. Treatability study results for Alternative 4S indicate that it is feasible. This alternative was the least expensive treatment option for soil remediation.

The Alternative 4Ga and Alternative 4S provide permanent solutions to the contamination problems of the ground water and soil. Contamination in both media will be addressed by on-site treatment or off-site disposal. The treatments specified for Alternative 4Ga and Alternative 4S will significantly reduce toxicity, mobility, and/or volume of the contaminants found in the Ewan Property ground water and soil, respectively.

RESPONSIVENESS SUMMARY

RECORD OF DECISION

EWAN PROPERTY (OPERABLE UNIT TWO)

Overview

The United States Environmental Protection Agency (EPA) held a public comment period from August 7, 1989 through September 11, 1989 for interested parties to comment on EPA's Operable Unit Two Feasibility Study (FS) and Operable Unit Two Proposed Remedial Action Plan of the Ewan Property Site.

To encourage public involvement during the public comment period, EPA held a public meeting on August 17, 1989 at the Indian Mills Public School in Indian Mills, New Jersey to describe the remedial alternatives and present EPA's proposed remedial alternatives for Operable Unit Two.

A responsiveness summary is required under the Superfund program for the purpose of providing EPA and the public with a summary of the interested parties' comments and concerns about the site, as raised during the public meeting and public comment period, and EPA's responses to those concerns. All comments summarized in this document were factored into EPA's final decision for selection of the remedial alternatives for cleanup.

This Responsiveness Summary contains the following appendices:

- Appendix A - Public Comment
    - Attachment A.1 - Public Notice
    - Attachment A.2 - August 17, 1989 Public Meeting Attendance Sheet
    - Attachment A.3 - Notice of Public Comment Period Extension
- Appendix B - New Jersey Department of Environmental Protection
    - Attachment B.1 - New Jersey Department of Environmental Protection Comments
    - Attachment B.2 - United States Environmental Protection Agency Responses

- Appendix C - Chrysler Motors Corporation
    - Attachment C.1 - Chrysler Motors Corporation Comments
    - Attachment C.2 - United States Environmental Protection Agency Responses

Comments from the nearby residents were presented during the public meeting. No written comments from the residents were furnished to EPA.

Background on Community Involvement

Residents reported to the Burlington County Health Department and NJDEP that buried drums were located at the Ewan Property site. Subsequently, residents held numerous meetings, signed petitions, and wrote letters to Federal, State and local officials requesting cleanup of the site. In February 1983, more than 100 residents participated in a meeting to discuss the site and how to get a government agency to clean-up the site. A petition with 92 signatures was submitted by the Coalition Against Toxics to the New Jersey congressional delegation requesting that the Ewan Property site be cleaned up. The Shamong Township Board of Education also requested help from EPA in developing an educational campaign for area school children about the Ewan Property site.

The primary concerns citizens have raised about the site include:

- Decreases in property values that residents feel may occur as a result of close proximity to the Ewan Property site;
- Potential contamination of potable wells if the contaminated groundwater spreads to the residential areas;
- Potential health risks associated with exposure to contaminants in soils, groundwater, and materials leaking from the buried drums;
- Potential disruption of the surrounding community during the implementation phase of remediation;
- Responsibility for remediation of the site, i.e. financial and statutory; and
- Perceived cleanup delays.

New Jersey Department of Environmental Protection (NJDEP) comments pertaining to remedial goals are contained in Appendix B. The EPA responses to the NJDEP comments are also contained in Appendix B.

2. Consistency of Regulatory Application to Previous New Jersey Pinelands Superfund Records of Decision

Chrysler also commented that application of N.J.A.C. 7:9-6.6(a) to the Ewan Property ground water remediation would be inconsistent with previous EPA Region 2 signed Records of Decision. EPA's review of the Chrysler comments indicates an apparent confusion concerning the "GW1 standards" in the N.J.A.C. 7:9-6.6(a) regulation. According to Chrysler, the "GW1 standard" would require remediation of the contaminated ground water to "background" concentrations.

In the Operable Unit Two Proposed Plan (the first of EPA's two decision documents for Operable Unit Two) EPA identified three promulgated, quantitative, numerical regulations as the goals for the Operable Unit Two ground water remediation: the Federal Safe Drinking Water Act (SWDA) Maximum Contaminant Levels (MCLs) contained in 40 CFR Part 141 and 40 CFR Part 143; and the State of New Jersey SWDA MCLs contained in N.J.A.C. 7:10-5, N.J.A.C. 7:10-7; and N.J.A.C. 9:7-6.6(a). EPA considers only these promulgated, quantitative, numerical portions of the Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria) as applicable regulations. Although N.J.A.C. 7:9-6.6(a) contains several non-numerical standards, EPA has selected the numerical remedial goals for these substances from the MCL listings found in the Federal SWDA and State SWDA. The NJDEP disagrees with this selection. Attached is the NJDEP letter and the EPA response.

Chrysler also stated that the Cooper Road Dump and Ciba-Geigy Records of Decision did not advocate the use of any New Jersey Pinelands related regulations as remedial goals. Since neither site is located within the New Jersey Pinelands these regulations are not applicable or relevant and appropriate to those sites.

Chrysler indicated that the Lang Property was determined to be located in both the New Jersey Central Pine Barrens area and the New Jersey Pinelands Preservation Area. Chrysler further claimed that EPA did not use the "GW1 standards", but chose to use only State and Federal standards in determining a remedy for the Lang Property. The State standards referred to in the Lang Property Record of Decision include the numerical portions of the Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria). Furthermore, the Lang Property Record of Decision was signed prior to the enactment of the Superfund Amendments and Reauthorization Act (SARA). SARA requires the use of more stringent applicable or relevant and appropriate State requirements. Therefore, Chrysler's argument is irrelevant.

The Ewan Property Proposed Plan cites the same ARARs that were identified in the Lang Property Record of Decision, which includes the promulgated, quantitative, numerical Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria).

3. Technical Feasibility of Proposed Alternative

EPA has determined that the remedial goals selected in the Operable Unit Two Proposed Plan can be reached. The contrary opinion presented by Chrysler's consultants was unsupported by technical evidence.

Furthermore, Chrysler claimed NJDEP "conceded" the Ewan Property ground water remediation may be unobtainable. NJDEP never conceded that the ground water remediation was impossible. It merely indicated that the Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria) contain standards which may be difficult to reach.

4. Analytical Detection Limits

Chrysler claimed that the detection limits required to recognize the remedial goals do not exist. The Operable Unit Two Feasibility Study activities (treatability studies and ground water sampling) used published analytical methods. These analytical methods had detection limits more sensitive than the Contract Required Detection Limits used in the EPA Contract Laboratory Program (see the attached NUS Corporation response).

5. Less Risk to Human Health and the Environment

Chrysler alleged that excavation of the residual contaminated soils would result in a discharge of volatile emissions.

Chrysler failed to recognize that EPA will implement site monitoring and contingency plans should volatile emissions begin to occur. These plans include engineering measures to insure the protection of public health and the environment while Operable Unit Two is in operation. Furthermore, similar soil excavations conducted in Region 2 have not resulted in any significant discharges of volatile organic contaminants.

6. Soil Treatability Study

Chrysler has maintained that the treatability studies conducted for the soils were an attempt to differentiate heavily contaminated materials from residually contaminated soils.

The only goal of the treatability studies was to determine the remedial effectiveness of solidification and solvent washing in removing contaminants from the Ewan Property soils. To make this determination two types of soils were used in the studies; soils which were heavily contaminated by source waste material, and soils which were slightly contaminated.

EPA used the heavily contaminated soils to evaluate the effectiveness of the technologies in the studies on materials which could potentially be missed in the Operable Unit One Remedial Action. The slightly contaminated soils were used to determine the effectiveness of the processes on soils which are anticipated to be present at the conclusion of the Operable Unit One Remedial Action.

EPA realizes that some refinements are required to optimize the soil extraction procedure (see the attached NUS Corporation response). The Treatability Studies were conducted to provide preliminary evidence concerning the remedial effectiveness of the technology in question. The Operable Unit Two Record of Decision will refer to the Pre-Remedial Design studies needed to identify the specific process to be used in the implementation of solvent extraction.

Furthermore, when EPA selects "On-Site Solvent Extraction followed by Soil Washing", it is not limited to the process used in the Treatability Study. Although triethylamine was used in a patented solvent extraction process, EPA will not limit the Operable Unit Two Pre-Remedial Design studies to repeating the Treatability Studies. The evidence provided by the solvent extraction treatability study illustrated that the technology could work at the Ewan Property and fulfill Superfund statutory requirements.

Comment:

A resident asked if the chemicals identified on site were carcinogenic.

EPA Response:

Many compounds have been identified on site. Some such as benzene, methylene chloride, and tetrachloroethene are considered to be carcinogenic. The Remedial Investigation report contains the complete risk analysis, including toxicity profiles for the indicator compounds selected for the Ewan Property site.

Comment:

Several residents inquired about EPA's contingency plans during remediation. They asked if the community would be involved during the development of any contingency plans.

EPA Response:

Contingency plans are developed by both EPA and contractors involved in the remediation of the site. Local officials, community groups, hospitals, and emergency units will be contacted in the development of these plans.

Future Activities

Comment:

Several residents expressed an interest in the schedule for the cleanup.

EPA Response:

Once a ROD is signed a design contractor will be hired. The remedial design phase of each operable unit will precede the remedial implementation phase. As yet a Record of Decision (ROD) has not been signed for Operable Unit Two. However, the remediation of Operable Unit One has an estimated duration of 1.5 years. The preferred alternative for groundwater remediation under Operable Unit Two has an estimated 10 year operation time, and the preferred alternative for soil under Operable Unit Two has an estimated 2 year remediation time.

Comment:

A resident asked if funds were available for residents and community groups to hire a contractor to oversee or examine what has been accomplished by EPA at the Ewan Property site.

EPA Response:

The Superfund law includes a program, known as the Technical Assistance Grant (TAG) for community groups to hire contractors for the purpose of review of the technical aspects of a site. Often, these reviewers are called upon to explain technical aspects of specific sites and the Superfund process. EPA offered to provide information regarding TAGs.

Comment:

A resident asked whether monitoring of the residential well at the Green Acres Park would be done by EPA as a precaution during the design and implementation phases.

EPA Response:

Monitoring of residential wells is something that EPA will consider during the design phase. Citizens were welcomed and encouraged to share their ideas on the safest way to implement the proposed remedial action.

Comment:

A resident inquired about whom to contact during remedial design and implementation if residents have questions.

EPA Response:

Residents should contact the EPA Remedial Project Manager, Craig De Biase, with any questions that they might have.

Remaining Concerns

Issues related to the implementation of the remedial action, including fencing and truck traffic, will continue to be areas of concern. The primary reason for continued concern is the potential for disruption to the community during the remedial action phase.

Appendix A

Public Comment

Attachment A.1

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
ANNOUNCES
PROPOSED CLEANUP ALTERNATIVES
FOR THE
OPERABLE UNIT TWO REMEDIATION
OF THE
EWAN PROPERTY SUPERFUND SITE
SHAMONG TOWNSHIP
BURLINGTON COUNTY, NEW JERSEY

The United States Environmental Protection Agency (EPA) has recently completed the Operable Unit Two Feasibility Study for the Ewan Property Superfund Site in Burlington County, New Jersey. This Superfund study evaluated remedial alternatives for the Operable Unit Two cleanup at the Ewan Property. EPA has identified preferred remedies for the Operable Unit Two cleanup which will address soil and groundwater contamination. Before final selection of the remedies, EPA will consider all comments on the Operable Unit Two Feasibility Study and Proposed Plan from August 7, 1989 to September 6, 1989. The final decision document will include a summary of significant public comments and EPA responses.

EPA will hold an informational public meeting on August 17, 1989 at 8:00 p.m. at the Indian Mills Public School on Medford-Indian Mills Road in Indian Mills, New Jersey to discuss the Operable Unit Two Feasibility Study and the preferred remedial alternatives for the Operable Unit Two cleanup. The first operable unit, which was selected in the Record of Decision issued by EPA in September 1988, addressed the remediation of the estimated 500 to 8000 buried drums and heavily contaminated materials at the site. EPA selected Off-Site Thermal Destruction and/or Treatment to remediate the buried drums and materials. The second operable unit will address residually contaminated soils and contaminated groundwater.

The Operable Unit Two Feasibility Study evaluated eight options for cleaning up the lesser contaminated soils and contaminated groundwater. For soils, these remedial alternatives were:

1) No Action with Administrative Controls
2) Excavation and On-Site Solvent Extraction Followed by On-Site Solidification
3) Excavation and On-Site Solvent Extraction Followed by On-Site Soil Washing
4) Excavation and Off-Site Incineration

For groundwater, the remedial alternatives were:

5) No Action with Administrative Controls
6) Collection and Ten Year Treatment with Reverse Osmosis and On-Site Re-injection of Groundwater
7, Collection and Ten Year Treatment with On-Site Re-injection of Groundwater
8) Collection and Three Year Treatment with On-Site Re-injection of Groundwater

EPA's preferred soil remedial alternative for Operable Unit Two is On-Site Solvent Extraction Followed by On-Site Soil Washing. The preferred groundwater remedial alternative is Collection and Ten Year Treatment with On-Site Re-injection of Groundwater.

The Operable Unit Two Feasibility Study, the Proposed Plan, and other site related documents are available at the following repository:

Mr. Lynn Heinhold
Shamong Township Clerk
Shamong Township Municipal Building
60 Willow Grove Road
Vincentown, New Jersey 08088

Written comments to the Operable Unit Two Feasibility Study and the Proposed Plan should be sent to:

Craig DeBiase
Project Manager
U.S. Environmental Protection Agency
26 Federal Plaza
Room 711
New York, New York 10278

Comments must be submitted to the above address, postmarked on or before September 6, 1989.

Superfund Update

Ewan Property Site

Shamong Township, New Jersey

EPA Region 2 **August 1989**

SIGN-IN SHEET

NAME, ADDRESS, TELEPHONE, AFFILIATION

1 E Gomez 21 Shawnee Trl 268-3488

2 Mark & Pat Lewis 55 Meetinghouse Ct 268-3312

3 31 Mill Road 268-2847

4 80 Tuckerton Rd 268 1468

5 7 Wallingford Way 268-9626

6 Walter Daniels 10 TREATY ELM LN. 268-9456

7 BRENT SENSENY 8 LAMPLIGHTER LANE 268 8509

8 Linda Cluck 8 " " "

9 Irene Cloud 357 Forked Neck Rd 268-1564

10 Susan Granbart 352 Forked Neck Rd 268-1687

11 GLENN BARNETT 352 FORKED NECK RD 268-1687

12 Bob Howell P.O. Box 7 New Lisbon N.J. 08064 (N.J. Pinelands Commission) 894-

13 Bob Marsh 66 Burnt House Rd. Vincentown 08088 268 9505

14 K. Shively 62 MANITOBA TR. VINCENTOWN, NJ 08088 268-9574

15

16

17

18

19

20

Attachment A.2

Superfund Update

Ewan Property Site

Shamong Township, New Jersey

EPA Region 2 **August 1989**

SIGN-IN SHEET

NAME. ADDRESS. TELEPHONE. AFFILIATION

1 Mary Anne Reinhart 24 Wharton Ct. 609-268-0688
2 [illegible] M. [illegible] 25 Wallingford Way (609) 268-9321
3 Edward [illegible] 22 WALLINGFORD WAY 268-1511
4 Mr + Mrs B. [illegible] 22 [illegible] [illegible]
5 Donald Austin 33 Bunker Hill Rd 654-2549
6 Fred [illegible] 19 Wallingford Way 268-2968
7 [illegible] M. Doublav 10- Meetinghouse CT. unlisted
8 Tom Doublav 15 - Meetinghouse CT. "
9 FRED WESCOE 1 SILVER LAKE 268-1510
10 [illegible] 34/6 Stokes Road 268-1408
11 JOSEPH REINHART 24 WHARTON CRT 268-0688
12 NEIL BROWN 4 NECK RD 268-1825
13 MR+MRS RICHARD BRAVERMAN 18 MEETINGHOUSE LANE 268-1818
14 FRANK D'ARIANO 9 WALLINGFORD WAY 268-2202
15 STEVEN LULIAS 11 WALLINGFORD WAY 268-1415
16 Mike Burlingame 401 E. State St. 984-7990 NJDEP
17 FRED LAWSON Burl. Co Health Dept. 265-5539
18 Michael Tancovich " " 265-5575
19 Mr + Mrs Al [illegible] 361 Tuckerton Rd 268-8849
20 Dennis [illegible] 23 Shawnee Tr. 268-9147

Superfund Update

Ewan Property Site

Shamong Township, New Jersey

EPA Region 2 **August 1989**

SIGN-IN SHEET

NAME, ADDRESS, TELEPHONE, AFFILIATION

1 E Gomez 21 Shawnee Tel 268 - 3488
2 Frank & Pat Lewis 55 Meetinghouse Ct 268-3312
3 [illegible] 31 Mill Road 268-2847
4 [illegible] 80 Tuckerton Rd 268 1468
5 [illegible] 7 Wallingford Way 268-9626
6 Walter Daniels 10 TREATY ELM LA. 268-9456
7 BRENT SENSENY 8 LAMPLIGHTER LANE 268 8509
8 Linda Cluck 8 " " "
9 Irene Cloud 357 Forked Neck Rd 268-1564
10 Susan Grambart 352 Forked Neck Rd 268-1687
11 GLENN BARNETT 352 FORKED NECK RD. 268-1687
12 Bob Howell P.O. Box 7 New Lisbon N.J. 08064 (N.J. Pinelands Commission) 894-
13 Bob Marsh 66 Burnt House Rd. Vincentown 08088 268 950-
14 K. Shively 62 MANITOBA TR. VINCENTOWN, NJ 08088 268-9574
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19
20

Attachment A.3

United States
Environmental Protection Agency
Region 2: New Jersey, New York
Puerto Rico, Virgin Islands
26 Federal Plaza, NY, NY 10278

NEWS

89 (99) Timothy Smith (212) 264-2515

FOR RELEASE: Tuesday, September 5, 1989

EPA EXTENDS PUBLIC COMMENT PERIOD AT EWAN PROPERTY SUPERFUND SITE

NEW YORK -- The U.S. Environmental Protection Agency has extended the public comment period on the Operable Unit Two Feasibility (FS) report, and the Operable Unit Two Proposed Plan for the Ewan Property Superfund site in Shamong Township, New Jersey until September 11, 1989.

The extension was granted following a request for more time to review and comment on the FS report, and Proposed Plan. EPA's proposed soil remedy is on-site solvent extraction followed by on site soil washing. The proposed remedial alternative for the groundwater is collection and ten year treatment with on-site reinjection of ground water. Copies of the FS report, the Proposed Plan, and other site related documents can be reviewed at the following information repository:

Shamong Township Municipal Building
60 Willow Grove Road
Vincentown, New Jersey 08088

-more-

The FS report discusses the potential options for addressing the soil and ground water contamination. The Proposed Plan identifies the preferred remedies for soil and ground water contamination. The Proposed Plan discusses the rationale for the preliminary selection of the preferred remedies.

Written comments on the Operable Unit Two Feasibility Study and Proposed Plan should be sent to:

Craig De Biase
Project Manager
U.S. Environmental Protection Agency
Room 711
26 Federal Plaza
New York, New York 10278

###

Appendix B

New Jersey Department of Environmental Protection

Attachment B.1

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION
CN 413, Trenton, N.J. 08625-0413
(609) 984-2902
Fax # (609) 633-2360

Anthony J. Farro
Director

SEP 11 1989

U.S. Environmental Protection Agency
Region 2
26 Federal Plaza, Room 711
New York, New York 10278

Attn: Mr. Craig De Biase,
Project Manager

Re: Ewan Property Superfund Site
Operable Unit Two

Dear Mr. De Biase:

In response to the U.S. Environmental Protection Agency's (USEPA) solicitation for public comments on the cleanup methods described in the "Proposed Plan for the Operable Unit Two Remediation for the Ewan Property Superfund Site", dated August 1989, the N.J. Department of Environmental Protection's (NJDEP) comments are presented herewith. Since the USEPA has released this Proposed Plan under their own initiative and without prior review by the NJDEP, our comments are lengthy and substantial.

Our foremost comment concerns the ground water cleanup goals described in the Plan. First, note that reference to New Jersey ground water quality standards that are intended to restore the pristine conditions of the Central Pinelands should reference N.J.A.C 7:9-6.4 through 6.7 and not just N.J.A.C 7:9-6.6. It is the NJDEP's position that the narratives found in these and other sections do constitute Applicable or Relevant and Appropriate Requirements (ARARS).

The reason we believe the above-noted standards are ARARs is based on our understanding of section 121 of CERCLA. Subsection d of 121 specifies the degree of cleanup that must be achieved at NPL sites. Subsection 2 of d states that if a hazardous substance, pollutant or contaminant remains on site and there is a promulgated standard, requirement, criteria or limitation under a state environmental law which is more stringent than the federal standard, and that standard has been identified to EPA, and it is legally applicable or relevant or appropriate under the circumstances of the release, then the remedial action shall attain such standards. 42 U.S.C. Section 121(d)(2)(A)(ii). Subsection (d)(2)(B) goes on to state that in determining if water quality criteria are relevant and appropriate the President must consider the "designated or potential use of this surface or groundwater, the environmental media affected, the purposes for which such criteria were developed, and the latest information available."

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The State identified to EPA several months ago the ARARs for this site, which is in the Central Pine Barrens. These ARARs included N.J.A.C.7:9-6.4 through 6.7, including the narratives in those sections. They state that there should be a non-degradation of waters in these Central Pine Barrens. We believe that these regulations, which are duly promulaged according to law, and have been consistently applied, must be part of any ARARs that are used for this site according to the statutory criteria set out above.

A reading of the proposed National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), dated December 21, 1988 (See 53 FR 51394 through 51520), confirms our opinion.

EPA proposed in December 1988 to place the discussion of ARARs in 40 CFR section 300.400. The EPA's discussion of that proposal is relevant at two places: Subpart E regarding EPA's approach for ground water remediation under the Superfund program, and Subpart F, compliance with the applicable or relevant or appropriate requirements of other laws. These discuss how ARARs are to be selected. Subpart E, at page 51433, engages in a discussion of EPA's approach for ground water remediation and notes that ground water classification is site-specific for Superfund remediation and may be superceded by other classification schemes promulaged by a state which are ARARs.

In the more specific discussion in Subpart F, the preamble notes on page 51438 that state anti-degradation statues "would be a potential ARAR." On page 51442 the preamble goes on to note that state water quality standards can be narratives. Therefore, according to the preamble of the NCP, specific numerical criteria as well as narrative standards are appropriately considered as applicable regulations for the Ewan property site.

As we stated at the outset, there is no indication that the criteria we have proposed for the ARARS from N.J.A.C. 7:9-6.4-6.7 are in any way outside of the requirements set out in the statute for ARARs, since EPA has provided no evidence that these are either inapplicable, inappropriate or irrelevant, nor has EPA provided any evidence that the State has inconsistently applied the standards.

Sincerely yours,

Anthony J. Farro, Director,
Division of Hazardous Site Mitigation

Attachments
HS227/al

cc: Assistant Commissioner Burke
R. Engel, DAG
Director Farro, DHSM
Assistant Director MacDonald, DRA
D. Martin, DRA
Assistant Director Putnam, DHSM
A. Charles, BEERA
L. Welkom, BGWPA
R. Yeates, DEQ
F. Cosolito, DEQ
S. Krietzman, DWR
B. Soboleski, BSM I
R. Collier, BSM I
M. Burlingame, BSM I
File: EWAN Property B8

Appendix B.2

United States Environmental Protection Agency Responses

United States Environmental Protection Agency
Response to the Comments for the Operable Unit Two Feasibility Study and Operable Unit Two Proposed Plan for the Ewan Property as presented by the New Jersey Department of Environmental Protection

Although United States Environmental Protection Agency (EPA) often requests that State agencies advise the Agency as to their views concerning cleanup requirements which may be imposed under state laws and regulations at sites, EPA is ultimately responsible for selecting and determining the "applicable" and the "relevant and appropriate requirements" ("ARARs") for cleanups of different media at Superfund sites. (*See* 53 Fed.Reg. 51,441.)

The anti-degradation policy (ADP) which the New Jersey Department of Environmental Protection (DEP) asserts should be used to establish cleanup requirements for groundwater at the Site is located within NJAC 7.9-6.4(h). That regulation states:

> The Central Pine Barrens Area constitutes a unique and particularly fragile ecosystem . . . In light of the vulnerable character of the area, the Department . . . *shall not*, in the performance of its statutory duties, *approve any activity which*, alone or in combination with any other activities, *will cause degradation* in the *existing* groundwater quality . (*emphasis added*).

The Agency has concluded that the ADP, as stated in NJAC 7.9-6.4(h) above, does not provide a basis for establishing quantified target cleanup levels for groundwater contaminants at the Ewan Site which can be required pursuant to CERCLA. The reasons for this are as follows:

1. "*Applicable*" requirements, within the context of remediations at Superfund sites, mean "those cleanup standards . . . criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA site." 53 Fed.Reg. 51,436.

Furthermore, to be "applicable", a requirement should meet the following four prerequisites: (a) the party be subject to the requirement's authority, (b) the activities be prohibited or directed by the regulation, (c) the substances or places be within the requirement's authority, and (d) the effective time period for the regulation. (*See* 53 Fed.Reg. 51,436.)

The Ewan Site is located within the "place", i.e., the Central Pine Barrens region covered by the regulation (i.e., the ADP). The proposed remedial action is also, at least arguably, within the "effective time period" of the regulation.

However, the ADP in question does not address any specific hazardous substance, pollutant or contaminant which exists at the Site. It does not refer to or relate to Superfund cleanups, in particular, or even any site cleanups, in general. The wording of the ADP itself is prospective; it talks in terms of activities which will cause degradation. The remedial action planned for the Site will not cause degradation of groundwater at the site and, therefore, it does not fall within the plain meaning of the those activities regulated by the ADP provisions. It is, therefore, not a regulated "activity" within the meaning of the ADP.

The ADP, therefore, fails to meet the prerequisites for an "applicable" requirement for CERCLA groundwater remediation at the Ewan Site.

2. "Relevant and appropriate" requirements, within the context of Superfund site remediations, mean "those cleanup standards . . . criteria or limitations promulgated under Federal or State law that, while not "applicable" . . . address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site." 53 Fed. Reg. 51,436. The determination of whether an alleged "requirement" is relevant and appropriate is a two-step process. The requirement must be determined to be both relevant and, even if relevant, appropriate for use at a particular site.

First, "relevance" is determined by comparing the action, location or chemicals covered by the requirement with related conditions at the site, release or potential remedy; a requirement is relevant if the requirement generally pertains to these conditions. (See 53 Fed.Reg. 51,436.) As noted above, the ADP, by its own wording, is prospective. It refers to activities which "will cause degradation". CERCLA remedial actions, such as that proposed for this site, are aimed at remediating pre-existing contamination, not causing some future degradation. Therefore, the ADP is not "relevant" to setting target cleanup levels in groundwater at the Ewan site.

Only those requirements which are both relevant and appropriate must be complied with. (See 53 Fed.Reg. 51,436.) Since the ADP is neither applicable nor relevant for establishing target cleanup levels for groundwater cleanup at the Ewan site, it does not constitute an ARAR under Section 121(d)(2) of CERCLA for remediation of groundwater at this site. This view is supported by EPA guidance which states that at a CERCLA site, a State ground water antidegradation law would not require cleanup to the aquifer's original quality. (See ARARs Q's & A's, OERR 9234.2-01FS, May 1989.)

Appendix C

Chrysler Motors Corporation

Attachment C.1

HOGAN & HARTSON

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111 SOUTH CALVERT STREET
BALTIMORE, MARYLAND 21202
301/659-2700

8300 GREENSBORO DRIVE
McLEAN, VIRGINIA 22102
703/848-2600

September 11, 1989

VIA TELECOPY AND FEDERAL EXPRESS

James P. Rooney, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
26 Federal Plaza
New York, NY 10278

Craig DeBiase
Project Manager
U.S. Environmental Protection Agency
26 Federal Plaza
New York, NY 10278

Re: Ewan Property/Shamong Township

Dear Messrs. Rooney and DeBiase:

Enclosed are the comments of the Chrysler Motors Corporation on the Feasibility Study (FS) for Operable Unit Two for the above-captioned site. They were prepared with the technical assistance of Hart Environmental Management Corporation and Goldberg-Zoino & Associates.

Through this letter, Chrysler is filing the enclosed comments today, the deadline for public comments on the FS. In addition to the copy that is being supplied via facsimile, another copy is being sent to you via Federal Express.

Sincerely,

David J Hayes

David J. Hayes

DJH/sw

cc: William C. Achinger
Lynn Y. Buhl, Esq.

6075H

CABLE: "HOGANDER WASHINGTON" • TELEX: 248370 (RCA), 892757 (WU) • FACSIMILE: 202/637-5910 • EASYLINK: 62778734

Attachment C.1

HOGAN & HARTSON

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301/659-2700

8300 GREENSBORO DRIVE
McLEAN, VIRGINIA 22102
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September 11, 1989

VIA TELECOPY AND FEDERAL EXPRESS

James P. Rooney, Esq.
Office of Regional Counsel
U.S. Environmental Protection Agency
26 Federal Plaza
New York, NY 10278

Craig DeBiase
Project Manager
U.S. Environmental Protection Agency
26 Federal Plaza
New York, NY 10278

Re: Ewan Property/Shamong Township

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Sincerely,

David J Hayes

David J. Hayes

DJH/sw

cc: William C. Achinger
Lynn Y. Buhl, Esq.

6075H

CABLE: "HOGANDER WASHINGTON" • TELEX: 248370 (RCA), 892757 (WU) • FACSIMILE: 202/637-5910 • EASYLINK: 62776734

COMMENTS ON THE FEASIBILITY STUDY FOR OPERABLE UNIT TWO

EWAN PROPERTY SITE
SHAMONG TOWNSHIP

Comments submitted by:

Chrysler Motors Corporation
September 11, 1989

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I. EXECUTIVE SUMMARY

These comments submitted by Chrysler Motors Corporation identify several major flaws in the Feasibility Study ("FS") for Operable Unit Two of the Ewan site that must prompt fundamental revisions in the FS before the Agency can adopt a Record of Decision ("ROD") for Operable Unit Two. In addition to these major flaws, the comments also identify several additional deficiencies that must be addressed prior to adoption of a ROD for the Second Unit.

A. Groundwater/Soil Cleanup Standards

The FS has proposed improper and unauthorized cleanup standards for Operable Unit Two. As explained at length below, the FS identifies a non-degradation groundwater cleanup standard (the "GW1" standard) and an extremely stringent soil cleanup standard that has been derived from the groundwater standard. The proposed CERCLA cleanup standard is based on the State of New Jersey's classification system for the Central Pine Barrens (also known as the Pinelands Preservation Area).

The proposed standard is neither applicable nor appropriate to CERCLA sites in general, or to the Ewan site in particular. As an initial matter, the Ewan site is not in the Central Pine Barrens and the groundwater standard simply does not apply to the site. Moreover, even if the site were located within the boundaries of the Central Pine Barrens, the standard nonetheless would not apply. EPA explicitly has determined that the GW1 standard is not applicable to the Tabernacle Drum Site, a CERCLA site that is located within the Central Pine Barrens. EPA has reached a similar conclusion for the Lang CERCLA Site, another site that is within the Central Pine Barrens.

EPA's prior determinations that the GW1 standard does not apply to CERCLA sites that are within the Central Pine Barrens applies with all the more force to sites, such as Ewan, which are outside the boundaries of the Central Pine Barrens. Indeed, EPA has confirmed on several occasions that the Pinelands standard does not apply to CERCLA sites that are located outside the Preservation Area including, for example, the Ciba-Geigy Chemical Corporation Site and the Cooper Road Dump. The rationale for EPA's prior rejection of the GW1 standard is equally applicable to the Ewan site. EPA previously rejected the GW1 standard as an ARAR because, among other failings, it is a non-numerical and non-quantitative standard that does not identify specific concentration limits for contaminants.

All of these key defects make the GW1 standard, and the soil cleanup standard derived from it, inapplicable and inappropriate for the Ewan site. If EPA were to adopt such standards in a ROD for Operable Unit Two, it would be promulgating legally unenforceable cleanup standards that are not consistent with statutory requirements set forth in Section 121 of the Superfund Amendments and Reauthorization Act.

B. Remedy Selection

Serious flaws in EPA's remedy selection process have resulted in the selection of inappropriate remedial measures for the Ewan Site. First, the FS confirms that there is no valid technical basis for distinguishing between "heavily contaminated soil" and "less heavily contaminated soil" at the Ewan Site. Despite the FS's inability to characterize so-called "heavily contaminated soil" and "less heavily contaminated soil," and despite its inability to identify a meaningful distinction between these arbitrary categories, the FS exacerbates the flaws of Operable Unit One by relying heavily on these artificial categories when analyzing potential remedial alternatives. Second, EPA's assessment of the extent and nature of soil contamination is based on flawed, unreliable interpolations from widely-spaced data. Because the volume and distribution patterns of volatile organic compounds and metals have a significant impact on the selection of treatment technologies, relying on inadequate data has caused EPA to overlook several promising remediation alternatives.

Even in the absence of these difficulties, the FS does not include a sound legal or technical basis for identifying a preferred remedial alternative for the Ewan Site. More specifically, there are several serious problems associated with the proposed solvent extraction/soil washing remedy that the FS has either ignored or addressed inadequately including, in particular, the remedy's ability (or inability) to accomplish the FS's remediation goals. The proposed remedy also presents potential concerns related to the release of volatiles during excavation that EPA has not addressed. In addition, the solvent proposed for use in extraction at the Ewan Site, triethylamine (TEA), has not been demonstrated to be effective, and its use creates serious odor problems that the FS has failed entirely to address. More generally, EPA has admitted that the TEA solvent extraction method is an unproven, experimental technology that may not be appropriate for CERCLA actions.

The FS's proposed groundwater pumping remedy is similarly flawed. EPA does not have sufficient data on either the age of the groundwater contamination or aquifer properties to develop a pumping scheme. Also, EPA relied on an overly simplistic method of estimating the required number of wells for the pumping remedy. As a result, EPA has no reliable basis for evaluating either the costs, or the effectiveness, of the groundwater remedy -- two essential elements of the remedy selection process. Moreover, in light of EPA's need to revise the groundwater cleanup standard that is applied to this site, the Agency must reevaluate the need for, and appropriateness of, the groundwater treatment system proposed in the FS.

In relying on an inadequate data base and failing to fully analyze all relevant alternatives, EPA has violated the statutory mandate of CERCLA, as well as its own guidelines for screening potential remedies. These guidelines require, at a minimum, that EPA evaluate the relative effectiveness, implementability, and cost of the possible remedies.

Because many of the deficiencies in the data base and in the evaluation of proposed remedies can be cured through further analysis and data collection, as will occur during the predesign phase of the Operable Unit One action, it is imperative that EPA await the availability of the forthcoming comprehensive site characterization data before issuing the ROD. EPA and Chrysler already have encountered difficulty in developing a Statement of Work for the initial phase of a cleanup (Operable Unit One) because the available data base is extremely limited. These difficulties will be compounded if EPA prematurely adopts a ROD for Unit Two. Indeed, it is Chrysler's strong view that issuance of a ROD for Unit Two on the current data base, without consideration of the forthcoming comprehensive site characterization, would be legally and technically flawed.

II. THE FEASIBILITY STUDY IMPROPERLY IDENTIFIES NEW JERSEY'S CLASS GW1 GROUNDWATER STANDARD AS AN ARAR FOR THE EWAN PROPERTY SITE

In the FS for Operable Unit Two, EPA identifies the Class GW1 groundwater standard applicable to the Pinelands Preservation Area (the Central Pine Barrens) as a location-specific ARAR for the Ewan Property Site. This decision in turn affects several aspects of the selected remedy, which are pegged to compliance with the Class GW1 standard including, in particular, the cleanup standard proposed for contaminated soils. 1/ The proposed GW1 standard, however, is not a proper ARAR for the Ewan site, for the reasons set forth below. Accordingly, the FS and the selected remedy must be reexamined to select an appropriate ARAR and to tailor the selected remedy accordingly.

1/ Both "Contaminated Soil Clean-up Goals" and "Contaminated Groundwater Clean-up Goals" are derived in part from the Class GW1 standard. See FS at 2-18, 2-23 (soil clean-up goal of preventing degradation of groundwater based on Class GW1); FS at 2-23, B-22 (soil clean-up goal of protecting against health effects from contamination of ground water based on Class GW1); FS at 2-32 (groundwater clean-up to background or non-detect based on Class GW1).

A. Background

1. The Class GW1 Standard

The FS selects Class GW1 as the appropriate groundwater standard for the Ewan Property Site because Class GW1 is the standard that applies to the Central Pine Barrens. FS at 2-10. New Jersey classifies Class GW1 groundwater as water "suitable for potable water supply, agricultural water supply, continual replenishment of surface waters to maintain the existing quantity and high quality of the surface waters in the Central Pine Barrens and other reasonable uses." N.J.A.C. 7:9-6.5(f). In general terms, Class GW1 groundwater is subject to a non-degradation standard, with the cleanup standards associated with such groundwater being either background levels or non-detection levels. See Memorandum of June 8 from Kevin Psarianos, Bureau of Site Management, NJDEP. As such, this standard establishes a goal of groundwater purity that is extremely difficult, if not impossible, to achieve.

2. The Pine Barrens

The Pine Barrens region of New Jersey is a sensitive ecological system which the State is committed to preserving. The State has established a Pinelands Commission, which "bears ultimate responsibility for implementing and enforcing the provisions of the Pinelands Protection Act and [the Pinelands Management] Plan." N.J.A.C. § 7:50-1.1; see also N.J.S.A. § 13:18A-4. The Pinelands Commission has divided the lands in the overall Pinelands Region into two primary areas: the Pinelands Preservation Area (i.e., the Central Pine Barrens), which is the most ecologically important and sensitive area, and the Pinelands Protection Area, a less sensitive region which lies outside the Preservation Area. N.J.S.A. § 13:18A-11. The Pinelands Commission has determined that the Ewan Property site is not located within the Pinelands Preservation Area, but instead lies in the Pinelands Protection Area. FS at 1-12.

3. ARARs

Section 121(d)(4) of CERCLA requires that a selected remedy attain "a level or standard of control for [hazardous substances] which at least attains [any] legally applicable or relevant and appropriate standard, requirement, criteria, or limitation." 42 U.S.C. § 9621(d)(4). Pursuant to this statutory mandate, the FS identifies numerous standards which may be applicable or relevant and appropriate requirements ("ARARs") for the Ewan Property site, including federal and state Safe Drinking Water Standards, as well as the groundwater protection standards set forth in N.J.A.C. 7:9-6.6 (i.e., the Class GW1 standard). As the summary accompanying the FS explains, the latter standards "were codified to maintain natural conditions of the Central Pine Barrens groundwater," and the remedy selected to meet these standards "would attempt to remediate the groundwater to the more stringent standards that have been developed for the protection of the Central Pine Barrens' unique ecosystem." FS Summary at 12.

B. The Class GW1 Standard is not an ARAR for the Ewan Property Site

1. The Class GW1 Standard is Not "Applicable" to the Ewan Property Site

Applicable requirements "may be identified on a site-specific basis by determining whether the jurisdictional prerequisites of a requirement fully address the circumstances at the site or the proposed remedial activity." 53 Fed. Reg. 51394, 51436 (Dec. 21, 1988) (Proposed National Pollution Contingency Plan ("NCP")). EPA states that a typical jurisdictional prerequisite is that "[t]he substances or places [be] within the authority of the requirement." Id. (emphasis added).

The FS applies the Class GW1 groundwater standard to the Ewan Property site because those standards apply to the Central Pine Barrens Region. The FS summary asserts that "the site . . . is defined by N.J.D.E.P. as being in the Central Pine Barrens Region of the New Jersey Pinelands." FS Summary at 12. In fact, however, the FS itself concedes that "[a]lthough the site is located near the border between the

Pinelands Preservation and Protection Areas, the Ewan Property is located within the Pinelands Protection Area," -- not within the Preservation area. FS at 1-12 (emphasis added). Moreover, as noted above, the authoritative agency for determining Pinelands status, the Pinelands Commission, has determined that the site lies outside the Pinelands Preservation Area, and lies instead in the less-sensitive Pinelands Protection Area. *Id.* at 2-11. Accordingly, the stringent Class GW1 standard, which "was developed to preserve and restore the pristine conditions of the Central Pine Barrens Region of the New Jersey Pinelands," FS Summary at 8 (emphasis added), does not apply to the Ewan Site, because that site is not within the region covered by that standard.

In addition to being outside the relevant area, EPA has recognized that the non-specific nature of the Pinelands groundwater standard makes it inapplicable to CERCLA cleanups. In a letter from EPA's Remedial Action Branch Chief regarding the cleanup of the Tabernacle Drum Site, a site located within the Central Pine Barrens, EPA clearly stated that "we do not believe that the non-degradation standard [of the Pinelands Comprehensive Management Plan] is an applicable requirement." Letter from John S. Frisco to William F. Harrison, Assistant Director of the Pinelands Commission (May 11, 1988) ("Frisco Letter"). The Frisco letter also noted that "it is EPA's policy to only consider numerical or quantitative standards in establishing cleanup goals for Superfund Sites," and since the Pinelands standard "does not identify specific concentration limits" for contaminants, EPA would not utilize the standard in determining appropriate cleanup levels. Id. Similarly, in EPA's Responsiveness Summary to the draft Feasibility Study for the Lang CERCLA Site, also located "within the Central Pine Barrens Water Quality Critical Area and the Pinelands Preservation Area," EPA Record of Decision, Lang Property Site, at 1 (Sept. 29, 1986) (emphasis added), EPA explained that "background levels [the standard recommended by the Pinelands Commission] do not provide well-defined criteria to measure whether an area has been cleaned of contamination." Final Responsiveness Summary to the Draft Feasibility Study Report, Lang Property Site, at 9. Accordingly, EPA elected to "rel[y] on State and Federal Standards to determine whether water quality is acceptable." Id.

2. The Class GW1 Standard is Not "Relevant and Appropriate"

In EPA's own terms, the primary task for determining whether a standard is relevant and appropriate, and thus eligible to serve as a location-specific ARAR, is whether the CERCLA site in question "is sufficiently similar to the location upon which the requirement is based." 53 Fed. Reg. at 51436. Determining whether a requirement is both relevant and appropriate, according to EPA's proposed NCP, is a two-step process. First, it is necessary to compare the location covered by the requirement and the "related conditions of the site"; a requirement is relevant "if the requirement generally pertains to these conditions." Id. Next, the comparison "is further refined by focusing on the nature of the substances, the characteristics of the site, the circumstances of the release, and the proposed remedial action; the requirement is appropriate if, based on such comparison, its use is well-suited to the particular site." Id.

While the FS is not clear on this point, EPA apparently has determined that the Class GW1 standard developed for the Central Pine Barrens also is relevant and appropriate for the Ewan Property Site, which lies outside the Central Pine Barrens, because the two areas are sufficiently similar. This is not, however, the case. The Agency charged with protecting the Pinelands, the Pinelands Commission, had an opportunity to classify the Ewan Property Site as within the Central Pine Barrens Region, but explicitly chose not to do so. A Summary of the Pinelands Plan (Feb. 6, 1981) at 5. The Commission's action reflects the State's decision that the area which includes the Ewan Property Site is not sufficiently similar to the Central Pine Barrens Region to merit equal protectiveness. Accordingly, EPA's attempt to apply the Central Pine Barrens' groundwater standards represents a fundamental legal flaw in the FS.

Moreover, the GW1 standard is not "appropriate" as applied in this case. According to the FS, the rationale for applying the GW1 classification outside of the Central Pine Barrens is a concern that contaminants from the Ewan Property Site will migrate to the more ecologically sensitive region. The record provides absolutely no support for such a concern. Only a limited groundwater plume is associated with the Ewan site, and there is no evidence whatsoever that migration of contaminants to the Central Pine Barrens area represents a realistic concern. To the contrary, the FS elsewhere acknowledges that the Ewan contamination is highly localized and amenable to local remedial efforts.

The cleanup standards for soil and groundwater set by the FS are also not "well suited to the particular site" as required by EPA's appropriateness criteria, see 53 Fed. Reg. at 51436, because they are simply not feasible. 2/ The soil cleanup goals identified in the FS are extremely low, and it is not clear whether the currently proposed remedial alternative, or any other remedial alternative, can accomplish these goals.

2/ Chrysler engaged the services of two technical consultants to review the FS and provide technical comments. The consultants, whose comments are incorporated into this feasibility discussion as well as into Part III below, are Hart Environmental Management Corporation, and Goldberg-Zoino & Associates.

As noted below at page 28, the solvent extraction/soil washing bench-top treatability testing performed on Ewan soil samples indicated that the proposed goals were not met, see Appendix E to the FS at E-18; moreover, as also noted below, solvent extraction/soil washing remains an unproven, experimental technology. Nonetheless, EPA has identified the solvent extraction/soil washing technique as the preferred remedial alternative for residually-contaminated soils for the Ewan Site.

EPA's proposed groundwater cleanup goals may also be technologically infeasible, and therefore inappropriate, for the Ewan Site. A June 7, 1988 NJDEP Memorandum concedes that the planned Ewan cleanup may not achieve the recommended groundwater standard, noting that "[i]f the . . . cleanup objectives are found by the contractor to be technologically unachievable then the cleanup objectives may be set based upon BAT (Best Available Technology)." See Attachment E to Appendix B of the FS.

The groundwater cleanup goals are also inappropriate because they may not be measurable. It may be difficult for laboratories to determine whether the groundwater cleanup goals are met, due to the laboratories' inability to reach detection limits as low as the proposed cleanup goals. A comparison of EPA's listed contract-required detection limits (CRDLs), see Attachment B to Appendix B of the FS, with the proposed Ewan groundwater cleanup goals, see FS at 2-34, illustrates this difficulty. Technical consultants working on Chrysler's behalf contacted two laboratories participating in EPA's Contract Laboratory Program (CLP) to inquire about their ability to reach detection limits at or below the proposed groundwater cleanup goals for the Ewan Site. Both of the CLP laboratories, ERCO and E3I, were skeptical about their ability, or that of other CLP laboratories, to meet the detection limits identified in the FS for a number of contaminants.

Both the soil and groundwater cleanup goals are thus technically infeasible, and must be reevaluated. EPA's own guidelines note that "technical factors," including "detection/quantification limits for contaminants, technical limitations to restoration, [and] the ability to monitor and control movement of contaminants," are among the "pertinent factors for modifying the remediation goals within the acceptable risk range." 53 Fed. Reg. at 51426. Review of these technical factors indicates that EPA should indeed consider modification of the FS's proposed soil and groundwater cleanup goals. To formulate technologically achievable, and therefore more appropriate, cleanup standards, additional treatability testing and laboratory studies are needed.

C. Even if the Class GW1 Standard Qualified as an ARAR, SARA's Waiver Principles Would Clearly Apply in This Case

Section 121(d)(4) of CERCLA provides for waiver of ARARs under certain specified conditions. While the Class GW1 standard is not an ARAR for the reasons set forth above, even if the standard were eligible for ARAR status, at least two of the statutory criteria for waiver would apply in this case.

1. The Class GW1 Standard Has Not Been Consistently Applied

Section 121(d)(4)(E) provides that waiver is appropriate when "the State has not consistently applied (or demonstrated the intention to consistently apply) the standard, requirement, criteria, or limitation in similar circumstances and other remedial actions within the State." 42 U.S.C. § 9621(d)(4)(E). In its proposed NCP, EPA noted that State standards should not be applied "where there is evidence that the State does not intend to apply them elsewhere." 53 Fed. Reg. at 51440. According to the proposed NCP, "EPA envisions using this waiver" when State requirements "[have] never [been] applied because of a lack of applicability in past situations," or when State standards "have been variably applied or inconsistently enforced." Id.

To evaluate the appropriateness of granting a waiver of a State requirement due to inconsistent application, EPA's Interim Guidance on Compliance with ARARs recommends evaluating the application of the requirement to similar sites or response circumstances, or examining the proportion of cases in which the requirement was not applied out of the total number of actions in which it could have been applied. 52 Fed. Reg. 32498 (Aug. 27, 1987). In addition, an intention to consistently apply a State standard may be evaluated through such materials as site remedial planning documents. Id.

Applying these waiver guidelines to the Pinelands GW1 standard, it is clear that the standard has not been applied consistently. For example, at the Tabernacle Drum Dump Site, located "in the northern region of the New Jersey Pine Barrens," EPA Record of Decision, Tabernacle Drum Dump, at 5 (June 30, 1988), the Pinelands groundwater standard was not used as an ARAR. The NJDEP Memorandum identified above confirms that the Pinelands groundwater standard was not applied to the Tabernacle Site. See Attachment E to Appendix B of the FS. In addition, the above-referenced letter from the New Jersey Remedial Action Branch Chief regarding the Tabernacle Site states that the Branch "do[es] not believe that the non-degradation standard [of the Pinelands Comprehensive Management Plan] is an applicable requirement." Frisco Letter, at 2.

EPA has not only failed to apply the Pinelands groundwater standard within the Pinelands Preservation Area, which presumably is the area of greatest concern for which the standard would be most appropriate, but it also has recently declined to apply the standard to nearby sites located outside the Preservation Area. See EPA Record of Decision, Ciba-Geigy Chemical Corporation Site (April 24, 1989); EPA Record of Decision, Cooper Road Dump (Sept. 30, 1987).

Thus, the FS's attempt to apply the GW1 standard appears to have been formulated solely for this case. When confronted with other Superfund sites located near the Pinelands Preservation Area, EPA never applied, or expressed an intention to apply, the GW1 standard. Instead, EPA explicitly stated that the Pinelands standard is not an applicable requirement. Hence, even if the class GW1 standard were to qualify as an ARAR (which it does not), waiver of the standard in this case would be fully appropriate.

2. Application of the Class GW1 Standard May Result in Greater Risk to Health and the Environment

Section 121(d)(4)(B) provides that an ARAR may be waived when compliance with it at a particular facility would result in greater risk to human health and the environment than alternative options. As is discussed in Part III of these comments, the remedy that EPA has selected to satisfy the stringent Class GW1 standard at the Ewan Property site presents unnecessary environmental risks, by allowing discharges of volatile organics through extensive excavation of less heavily contaminated soils. The massive excavation process, needed in order to utilize the solvent extraction portion of the soil remedy, will release volatiles to the air that otherwise would not be released in an uncontrolled manner. Thus, the very techniques used to reach the nearly-impossible cleanup standards for the Central Pine Barrens may have the ironic result of increasing public exposure to hazardous materials.

III. THE REMEDY SELECTED BY THE FS IS NOT SUPPORTED BY ADEQUATE DATA

A. The Existing Data Base Does Not Support EPA's Attempt to Distinguish Between "Heavily Contaminated" and "Less Contaminated" Soils

As Chrysler noted in its comments on Operable Unit One, there is no sound basis for distinguishing between "heavily contaminated soils" and "less heavily contaminated soils." The FS for Operable Unit Two compounds the flaws of Operable Unit One by perpetuating this arbitrary distinction.

The Agency's own treatability studies demonstrate that EPA's attempt to draw a line between soil types is unsound and unworkable. In attempting to collect a composite sample of heavily contaminated materials for treatment evaluation, the FS relied on samples from an area previously classified as heavily contaminated only to find that the soil sample was much more diluted than expected; indeed, the sample met the cleanup goals identified in the ROD for Operable Unit One for all but one parameter (phenol). In light of EPA's own difficulties in differentiating between contaminated soils, Chrysler believes that the Agency should reassess its approach to soil contamination and limit the Operable Unit One remedy -- incineration -- to drums and their contents.

The results of the treatability study lend further support to this approach. The study found that the solvent extraction/soil washing remedy, which the FS selected for use on the less contaminated soils, was as effective against "heavily contaminated soils." Thus, if the FS's own analysis of the solvent extraction/soil washing method is correct, soils currently slated for incineration as part of Operable Unit One could be treated as part of Operable Unit Two while still protecting public health and the environment. An additional advantage to such an approach is that the unit cost of solvent extraction/soil washing is significantly lower than that for incineration, thereby satisfying CERCLA's cost-effectiveness requirement. See 42 U.S.C. 9621(a). Together with EPA's inability to distinguish between heavily contaminated and less heavily contaminated soils, the Agency's evaluation of the solvent extraction/soil washing remedy suggests that the most effective and efficient approach to the site's soil contamination problem is to treat all of the soil together and reserve incineration for drums and their contents.

B. The Existing Data Base Does Not Support the FS's Evaluation of the Extent and Nature of Soil Contamination

The FS's selection of an appropriate remedy is based in part on the Agency's assessment of the extent and nature of soil contamination at the site. That assessment, however, is based on flawed assumptions and interpolations from widely-spaced data which, to the extent they are useful at all, suggest that the FS's selected remedy is not well-suited to the conditions at the Ewan site.

Based on soil-gas screening, geophysical surveys and soil samples from a limited number of test pits and soil borings, the FS concludes that there are 22,000 cubic yards of "residually contaminated soil" requiring remediation as part of Operable Unit Two.

There is virtually no data that supports such a conclusion. First, while soil-gas screening and geophysical surveys provide useful "first cut" information on possible locations of areas of past waste disposal and contamination, they cannot serve as a substitute for detailed investigations into the nature and extent of the contamination. Although the FS suggests that such investigations may be underway, the results of these investigations were not provided to Chrysler. A second key difficulty is that the number of soil explorations undertaken to confirm the presence of contaminated materials -- eight test pits and thirteen soil borings -- is insufficient considering that the area of potential concern covers nine acres. It is inconceivable that the kind of thorough assessment of site conditions necessary for the development of a ROD could be made on the basis of twenty-one widely-spaced soil explorations, almost half of which failed to detect contamination levels in excess of proposed cleanup goals. In addition, of the site explorations which detected significant contamination levels, the contamination was found either in surficial or in deeper soils, but not both. Thus, the FS's assumption that both layers of soil would always need to be treated is not consistent with the data. Finally, the FS's assumption of an average depth of excavation of eight feet below ground surface, approximately two feet below the average water table in this area of the site, is not supported by the laboratory data collected to date. As a result, EPA has included "soil" in its estimate that is at or below the groundwater table, and it also has assumed - without support -- that all levels of soil are contaminated.

In addition to failing to adequately assess the volume of contaminated soil, the limited data collected during the RI fail to provide an accurate picture of the identity and distribution of the soil contaminants -- an essential element of the remedial selection process. Of the eight test pits excavated in Area A, volatiles were detected in only four. Contaminant concentrations were found to exceed proposed soil cleanup goals in only three of the eight test pits. In addition, of thirteen soil borings installed in Area A, contaminant concentrations above proposed soil cleanup goals were observed in only eight of the borings; only six borings had levels of one or more metals in excess of the proposed soil cleanup goals. Volatile organics were detected in excess of proposed soil cleanup goals in three of the same borings, and in surficial soil samples only from three other borings. Semi-volatile organics were observed in only two of the thirteen borings.

These data indicate that the site is characterized by smaller, localized areas of contamination, due to past waste burial in pits and trenches, rather than the 22,000 cubic yards of contamination estimated by the FS. Moreover, the data indicate that volatile organics are the most widely distributed class of compounds on the site, while metals and semi-volatile organics have been detected above proposed soil cleanup goals in only a limited number of locations. As a result of EPA's failure to assess the implications of this data, the Agency has identified an inappropirate remedial alternative as its "preferred alternative," and has failed to consider combinations of proven technologies that appear to be well-suited to the Ewan Site's contamination pattern.

C. The FS's Soil Remediation Screening Process Improperly Excluded Cost-Effective Combinations of Technologies

The evaluation process conducted to screen the various remedial alternatives for the Ewan Site failed to satisfy CERCLA's statutory requirements, or EPA's own screening guidelines, and it would be highly improper for EPA to issue a ROD, which constitutes a final decision regarding the appropriate remedy, based upon this insufficient evaluation.

Section 121 of CERCLA requires that certain factors be considered in the remedy-selection process. For example, the potential threat to health and the environment associated with the proposed remedy, as well as its long-term maintenance costs, must be considered. See 42 U.S.C § 9621(b)(1). The guidelines contained in EPA's proposed NCP, which are based on the statute, state that the remedy screening process involves "a preliminary evaluation of the relative effectiveness, implementability, and cost of the alternatives." 53 Fed. Reg. at 51427. The purpose of the screening process is to "ensur[e] that the number and the types of alternatives carried forward matches the nature and complexity of the site problems," id. at 51428, since "EPA believes that it often will be the case that the most appropriate solution for a site will involve a combination of methods of achieving protection of human health and the environment." Id. at 51423.

It is clear that the full range of treatment options was not considered in the FS, as the statutory and agency guidelines require. As described above, EPA relied upon an erroneous conclusion -- that substantial volumes of soil are contaminated with several classes of contaminants -- to select the solvent extraction/soil washing treatment alternative. Because the limited data indicate that the site is in fact characterized by smaller pockets of unevenly distributed contaminants, and because the differing distribution patterns of volatiles and metals should have a significant impact on the identification and evaluation of treatment technologies, other treatment alternatives are available and need to be considered as part of the FS process.

One technology alternative eliminated from consideration by EPA but requiring further study is in-situ soil vapor extraction, also known as vacuum extraction or soil venting, which is well suited to the remediation of volatiles-contaminated, unsaturated-zone soils. Although the FS acknowledged that this treatment technology "is generally useful in reducing organic contamination, particularly volatiles," FS at 2-43, its use for the Ewan Site was rejected because EPA believed it might not affect inorganic, and in some cases semi-volatile, contamination, thus requiring the use of additional technologies to address this contamination. Id. EPA also noted that environmental and process control of in-situ reaction processes is much more difficult than above-ground processes. Id.

EPA's reservations notwithstanding, the soil vapor extraction option has several advantages which the FS has completely overlooked. First, trench-based vapor extraction systems have been used to successfully remediate unsaturated-zone soil under shallow water table conditions. In addition, this approach is extremely cost-effective; cleanup to detection limit levels has been demonstrated at costs ranging from $20 to $50 per cubic yard for large sites. Also, because vapor extraction eliminates the release of volatiles associated with soil remediation technologies requiring excavation, it may be more protective of public health and the environment. Moreover, vapor extraction is a demonstrated technology which is widely used for remediating the type of granular soil present at the Ewan Property Site.

It is possible, as the FS asserts, that vapor extraction may not fully address inorganic or semi-volatile contamination. However, this technology could still be effectively utilized in combination with other treatment options; as noted above, EPA "believes that it often will be the case that the most appropriate solution for a site will involve a combination of methods." 53 Fed. Reg. at 51423. Accordingly, smaller volumes of soil contaminated with semi-volatiles and metals could be remediated using several methods, none of which were considered in the FS. For instance, the soil could be treated on-site via a microencapsulation-based solidification method, such as the service offered by HAZCON, Inc. and hailed by EPA. EPA/540/A5-89/001, May 1989.

Remarkably, the FS failed completely to discuss or analyze possible combinations of different cost-effective treatment technologies including, for example, the use of in-situ soil vapor extraction to address volatiles and supplemental additional approaches to treat semi-volatiles and metals. Relying on an extraordinarily sparse data base, the FS adopted an extraordinarily simplistic approach when screening remedial alternatives. With tens of millions of dollars at stake, and with the need to identify a workable and effective remedy, EPA should not endorse this short-cut approach -- especially when much more comprehensive data will soon become available which is directly relevant to the remedy selection process.

D. The Predesign Work Scheduled in Connection With the Implementation of Operable Unit One Will Provide the Data Needed to Identify a Preferred Alternative for Operable Unit Two

The proposed pre-design study incorporates numerous elements specifically designed to provide a more comprehensive understanding of the composition and extent of contamination at the Ewan site. The five most critical elements of the proposed pre-design study in this respect are: (1) a supplemental geophysical study; (2) a soil gas analysis; (3) a soil sampling/test pit program; (4) an incineration study; and (5) aquifer testing for dewatering excavation. All of these analyses will provide extensive data that will assist EPA in identifying an appropriate remedy for Operable Unit Two.

The supplemental geophysical study will further delineate the extent of buried drums and provide a basis for evaluating the need to implement dewatering of the excavation.

The study will also be useful in identifying areas which should be directly investigated in the soil sampling/test pit program.

The soil gas analysis will delineate areas of source contaminants and more closely define shallow groundwater contamination. The data compiled from this analysis will be useful in further defining excavation limits and clarifying the distribution of volatile contaminants across the site.

The proposed pre-design study also envisions a program of soil sampling in conjunction with extensive test pitting which will collect visual and analytical data for source characterization and help in further defining limits of contamination, developing a more accurate estimate of the number of drums and evaluating the need for dewatering of the excavation.

The incineration study will help differentiate between wastes appropriate for thermal destruction and wastes that are more suitable for other treatment technologies.

Finally, the pre-design study provides for limited aquifer testing to collect the required design parameters associated with the implementation of a temporary dewatering system for use during waste excavation activities. This undertaking will provide invaluable information that can be used in subsequent predesign.

Clearly, the proposed pre-design study will collect extensive data relating to the characterization of the site, including waste descriptions, disposal characteristics, subsurface conditions, dewatering requirements, and visual analysis. In light of the fact that this critical information will be available in the near future, there is simply no justification for formulating a remedy for Operable Unit Two without it.

E. There Are Serious Issues Related to the FS's Preferred Soil Remediation Alternative That Have Not Been Addressed

EPA's preferred remedial alternative for residually-contaminated soil (the solvent extraction/soil washing technique) involves the on-site excavation and treatment of soil, followed by soil rinsing, and the off-site incineration of spent solvent. Despite EPA's assertion that "treatability studies for the preferred alternative, Solvent Extraction/Soil Washing, have shown that the cleanup goals for the soils can be attained," FS Summary at 15, it is by no means certain that EPA's chosen remediation alternative can accomplish the soil cleanup goals proposed in the FS. In fact, the solvent extraction/soil washing bench-top treatability testing performed on Ewan Property Site soil samples indicated that the proposed cleanup goals were not met. *See* Appendix E to FS at E-18. In particular, the testing indicated that metals would not be substantially removed through solvent extraction/soil washing. *Id.*

In addition to questions regarding overall effectiveness, EPA's chosen soil remediation technique raises other issues of concern. For example, in selecting the solvent extraction/soil remediation alternative, EPA did not adequately examine the potential dangers resulting from the release of volatiles associated with excavation. The FS merely notes that "[a]ir monitoring may be necessary during the excavation." FS at 2-80. Such excavation-related releases have the potential to pose a threat to human health and the environment, and their impact must be fully considered before a final remedy choice is made.

Another issue raised by the choice of the solvent extraction/soil remediation alternative is EPA's proposal that the solvent triethylamine (TEA) be used for extraction at the Ewan Site, even though there are serious drawbacks to the use of TEA. First, the removal efficiency of TEA is doubtful. During the bench-scale treatability testing, extraction with TEA did not substantially reduce volatile and semi-volatile organic compounds beyond that achieved with water. Id. Moreover, the use of TEA solvent extraction technology is still somewhat experimental. TEA solvent extraction has not yet been demonstrated in full scale applications for the treatment of contaminated soil; EPA's own Hazardous Waste Engineering Research Laboratory acknowledges that treatment of contaminated soil via solvent extraction "is still considered an emerging technology requiring further development and refinement." Conversation with Ed Bates, U.S. Environmental Protection Agency, Aug. 31, 1989.

Yet another problem presented by the use of TEA is its very low odor threshold. The inevitable release of even minor amounts of TEA during soil excavation and processing will create a serious nuisance to on-site workers and nearby residences. In addition, low levels of residual TEA are likely to remain in the treated soil that will be backfilled on the site.

The FS failed to address any of these serious deficiencies at the same time that it stated its preference for use of the solvent extraction/soil washing technique for soil remediation. Further analysis, including consideration of other remedial alternatives, is essential before a final decision can be reached regarding the most appropriate means of meeting soil cleanup goals.

F. The FS's Recommended Groundwater Pumping Scheme Is Not Supported by Sufficient Data

The proposed groundwater remedy is not backed by sufficient data with respect to either the age of the groundwater contamination or aquifer properties. These issues must be addressed before an appropriate remedy can be developed.

At the present time, there is no firm basis for determining when the groundwater contamination originated. The observed contamination may have originated when the drums were first buried more than thirteen years ago; conversely, the observed contamination could be the result of recent drum deterioration in which case the groundwater plume would be relatively young. This uncertainty, in conjunction with the lack of information on the vertical distribution of groundwater contaminations and uncertainties in transportation rates, makes it impossible to determine the optimum locations for extraction wells.

The FS is similarly deficient with respect to data related to aquifer properties. The estimate of the aquifer's transmissivity was based on small scale, short duration, field tests. Chrysler's technical consultants reviewed these test results in conjunction with a mass balance calculation (areal recharge versus ambient groundwater flow) and determined that the minimum volume of groundwater which needs to be pumped may be greater than that indicated in the FS. In addition, the FS did not include direct measurements of organic carbon. This omission is critical because the pumping duration required by the FS was based on a simplistic analytical model used by EPA's consultant which is very sensitive to the percentage of organic carbon present in the aquifer. Consequently, both the pumping rate and the pumping duration are no more than educated guesses.

The FS also used an overly simplistic method to estimate the number of required wells. It did not consider the potential inefficiency generally associated with pumping at higher rates. (The capture zone of withdrawal wells increases with increased pumping rates. Thus, at larger pumping rates more uncontaminated groundwater is generally withdrawn than with pumping at a lower rate; albeit for longer durations.) Additionally, computer analyses of the proposed scheme indicates that the withdrawal/injection, presented in the FS, may not create a hydraulically isolated zone.

These flaws in the FS clearly demonstrate that more data is necessary before the proposed remedy can be properly evaluated. The logical approach is to use information obtained during the drum removal process, in conjunction with monitoring and pump testing, to develop the required data base. Visual observations made during drum removal should provide an insight into the age of the groundwater contamination. (Open or crushed drums and heavy contaminated soils versus rusted drums in generally clean soils.) These data, together with additional information on aquifer properties, will allow for a far more detailed evaluation of the required size of the withdrawal system. Once such information is developed, studies can be undertaken to evaluate the costs and benefits of using various pumping rates and pumping durations.

IV. CONCLUSION

The FS for Operable Unit Two for the Ewan Property Site+ is seriously deficient. The cleanup standards proposed by the FS are improper and inapplicable to the Ewan Site, and thus violate the statutory requirements of Section 121 of CERCLA. In addition, EPA has failed to comply with the relevant remedy selection requirements and, as a result, has proposed inappropriate remedial alternatives. A ROD issued at this time would be based on inadequate data, improper standards, and non-compliance with CERCLA's statutory mandate. Therefore, EPA should await additional information and further analysis, as will be forthcoming in the predesign work for the site, before issuing the ROD for the Ewan Site.

Appendix C.2

United States Environmental Protection Agency Responses

United States Environmental Protection Agency Response to the Comments for the Operable Unit Two Feasibility Study and Operable Unit Two Proposed Plan for the Ewan Property as presented by Chrysler Motors Corporation

1. Ewan Property Site Location

Chrysler Motors Corporation (Chrysler) alleged that the remedial objectives for the Operable Unit Two remediation at the Ewan Property were unsubstantiated. The United States Environmental Protection Agency's (EPA) review of these comments indicates that Chrysler has misunderstood the site location and the applicability of the regulations supporting the Operable Unit Two remedial goals.

The New Jersey Pinelands area is regulated by both the New Jersey Pinelands Commission (NJPC) and the New Jersey Department of Environmental Protection (NJDEP).

NJPC, in accordance with the New Jersey Pinelands Comprehensive Management Plan, divides the New Jersey Pinelands into ten specific areas: Preservation Area, Forest Areas, Agricultural Production Areas, Special Agricultural Production Areas, Rural Development Areas, Regional Growth Areas, Pinelands Towns, Military and Federal Installation Areas, Pinelands Villages, and areas within the Pinelands National Reserve but outside the State designated Pinelands Area.

NJDEP identifies a portion of the New Jersey Pinelands as the Central Pine Barrens Area. The Central Pine Barrens Area is defined by drainage basins located within southern New Jersey Pinelands. The defined region of the Central Pine Barrens is described in the New Jersey Administrative Code, Title 7, Chapter 9, Subchapter 6, Section 7, Subsection (c) (N.J.A.C. 7:9-6.7(c)):

> The Central Pine Barrens Area (The Boundary of the Central Pine Barrens is further clarified by the Official Map which is available for review at the New Jersey Department of Environmental Protection, Division of Water Resources or appropriate county planning board, board of health, or municipality.) boundaries will underlie the following surface water drainages;
>
> 1. Mullica River Watershed: . . .

2. Cedar Creek (Lacey Township and tributaries upstream of Route 9, (head of tide) surrounded by the northern ridgeline; and the southern ridgeline west of the Garden State Parkway and the southern ridgeline (between the Garden State Parkway and Route 9) as defined by Lacey Road, Manchester Avenue, and Haines Road.

3. All fresh waters west of the Garden State Parkway bounded by the Mullica and Cedar Creek (Lacey Township) watersheds.

4. Toms River Watershed: . . .

5. Rancocas Creek Watershed: . . .

6. The Central Pine Barrens boundary underlies the surface water drainages in the following State and National Park, Forests, and Fish and Wildlife lands: . . .

Chrysler believes that the New Jersey Pinelands Preservation Area and New Jersey Central Pine Barrens have the same boundaries. This is incorrect. A review of the New Jersey Pinelands Comprehensive Management Plan indicates which areas of the New Jersey Pinelands are classified as the New Jersey Pinelands Preservation Area. Application of the previously quoted N.J.A.C. 7:9-6.7(c) to a reliable map of New Jersey, or review of the previously mentioned NJDEP Official Map, indicates the area known as the New Jersey Central Pine Barrens. Further comparison of these two areas illustrates that there is some overlap but not a continuous overlay.

Chrysler was correct in stating that the Ewan Property is located outside of the New Jersey Pinelands Preservation Area. In fact, NJPC has determined that the Ewan Property is presently located within an Agricultural Production Area and Rural Development Area. However, as determined by NJDEP and N.J.A.C. 7:9-6.7(c), the Ewan Property is located within the boundary of the Central Pine Barrens.

2. Consistency of Regulatory Application to Previous New Jersey Pinelands Superfund Records of Decision

Chrysler also commented that application of N.J.A.C. 7:9-6.6(a) to the Ewan Property ground water remediation would be inconsistent with previous EPA Region 2 signed Records of Decision. EPA's review of the Chrysler comments indicates an apparent confusion concerning the "GW1 standards" in the N.J.A.C. 7:9-6.6(a) regulation. According to Chrysler, the "GW1 standard" would require remediation of the contaminated ground water to "background" concentrations.

In the Operable Unit Two Proposed Plan (the first of EPA's two decision documents for Operable Unit Two) EPA identified three promulgated, quantitative, numerical regulations as the goals for the Operable Unit Two ground water remediation: the Federal Safe Drinking Water Act (SWDA) Maximum Contaminant Levels (MCLs) contained in 40 CFR Part 141 and 40 CFR Part 143; and the State of New Jersey SWDA MCLs contained in N.J.A.C. 7:10-5, N.J.A.C. 7:10-7; and N.J.A.C. 9:7-6.6(a). EPA considers only these promulgated, quantitative, numerical portions of the Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria) as applicable regulations. Although N.J.A.C. 7:9-6.6(a) contains several non-numerical standards, EPA has selected the numerical remedial goals for these substances from either the of MCL listings found in the Federal and State SWDA. The NJDEP disagrees with this selection. Attached is the NJDEP letter and the EPA response.

Chrysler also stated that the Cooper Road Dump and Ciba-Geigy Records of Decision did not advocate the use of any New Jersey Pinelands related regulations as remedial goals. Since neither site is located within the New Jersey Pinelands these regulations are not applicable or relevant and appropriate to those sites.

Chrysler indicated that the Lang Property was determined to be located in both the New Jersey Central Pine Barrens area and the New Jersey Pinelands Preservation Area. Chrysler further claimed that EPA did not use the "GW1 standards", but chose to use only State and Federal standards in determining a remedy for the Lang Property. The State standards referred to in the Lang Property Record of Decision include the numerical portions of the Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria). Furthermore, the Lang Property Record of Decision was signed prior to the enactment of the Superfund Amendments and Reauthorization Act (SARA). SARA requires the use of more stringent applicable or relevant and appropriate State requirements. Therefore, Chrysler's argument is irrelevant.

The Ewan Property Proposed Plan cites the same ARARs that were identified in the Lang Property Record of Decision, which includes the promulgated, quantitative, numerical Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria).

3. Technical Feasibility of Proposed Alternative

EPA has determined that the remedial goals selected in the Operable Unit Two Proposed Plan can be reached. The contrary opinion presented by Chrysler's consultants was unsupported by technical evidence.

Furthermore, Chrysler claimed NJDEP "conceded" the Ewan Property ground water remediation may be unobtainable. NJDEP never conceded that the ground water remediation was impossible. It merely indicated that the Central Pine Barrens criteria (see the N.J.A.C. 7:9-6.6(a) GW-1 Criteria) contain standards which may be difficult to reach.

4. Analytical Detection Limits

Chrysler claimed that the detection limits required to recognize the remedial goals do not exist. The Operable Unit Two Feasibility Study activities (treatability studies and ground water sampling) used published analytical methods. These analytical methods had detection limits more sensitive than the Contract Required Detection Limits used in the EPA Contract Laboratory Program (see the attached NUS Corporation response).

5. Less Risk to Human Health and the Environment

Chrysler alleged that excavation of the residual contaminated soils would result in a discharge of volatile emissions.

However, Chrysler failed to recognize that EPA will implement site monitoring and contingency plans should volatile emissions begin to occur. These plans include engineering measures to insure the protection of public health and the environment while Operable Unit Two is in operation. Furthermore, similar soil excavations conducted in Region 2 have not resulted in any significant discharges of volatile organic contaminants.

6. Soil Treatability Study

Chrysler has maintained that the treatability studies conducted for the soils were an attempt to differentiate heavily contaminated materials from residually contaminated soils.

The only goal of the treatability studies was to determine the remedial effectiveness of solidification and solvent washing in removing contaminants from the Ewan Property soils. To make this determination two types of soils were used in the studies; soils which were heavily contaminated by source waste material, and soils which were slightly contaminated.

EPA used the heavily contaminated soils to evaluate the effectiveness of the technologies in the studies on materials which could potentially be missed in the Operable Unit One Remedial Action. The slightly contaminated soils were used to determine the effectiveness of the processes on soils which are anticipated to be present at the conclusion of the Operable Unit One Remedial Action.

EPA realizes that some refinements are required to optimize the soil extraction procedure (see the attached NUS Corporation response). The Treatability Studies were conducted to provide preliminary evidence concerning the remedial effectiveness of the technology in question. The Operable Unit Two Record of Decision will refer to the Pre-Remedial Design studies needed to identify the specific process to be used in the implementation of solvent extraction.

Furthermore, when EPA selects the process of On-Site Solvent Extraction followed by Soil Washing, decision it is not limited to the process used in the Treatability Study. Although triethylamine was used in a patented solvent extraction process, EPA will not limit the Operable Unit Two Pre-Remedial Design studies to repeating the Treatability Studies. The evidence provided by the solvent extraction treatability study illustrated that the technology could work at the Ewan Property and fulfill Superfund statutory requirements.

7. Remedial Summary

At present, Operable Unit One is a full year behind schedule due to protracted negotiations with Chrysler. Delaying a remedial decision on Operable Unit Two would slow down the site remediation further. These delays would permit the ground water contaminated plume to continue to migrate. EPA believes that there is enough data available to make a decision at the present time.

Ground Water Remedy Selection

EPA believes that the ground water remediation should to begin immediately following the source waste treatment. Therefore, the design of the ground water system should begin as soon as possible. Delay of the ground water remedial design would allow the contaminated ground water plume to continue to migrate. EPA believes the advantages of treating the plume at an early stage are:

- Reduced likelihood of human ingestion of contaminated ground water;
- Earlier treatment of presently deteriorated portion of New Jersey Pinelands natural resources;
- Construction and operation of a smaller treatment plant;
- Earlier completion of the site remediation; and
- Increased cost-effectiveness.

EPA believes that the remedial objectives for both soil and ground water are feasible (see the attached NUS Corporation response) and that remedial designs and actions can be developed to meet these goals. EPA maintains that an applicable ground water remedial goal for the Ewan Property is contained in N.J.A.C. 7:9-6.6(a). Contrary to Chrysler's conclusion, N.J.A.C. 7:9-6.6(a) contains numerical and quantitative standards for thirty of thirty-six listed pollutants and chemical substances. Other promulgated regulations which directly relate to remediation of the Ewan Property ground water (and the EPA Ground Water Protection Strategy) are the Federal SWDA MCLs and the State of New Jersey SWDA MCLs (see the Operable Unit Two Proposed Plan for the Ewan Property).

Soils Remedy Selection

Chrysler has stated that the volume and distribution patterns of the volatile organic compounds and metals will affect remedial technology selection. The waste disposal practices at the Ewan Property involved random placement of wastes within trenches. Therefore, since each drum may contain different waste, no discernable waste patterns can be identified.

Chrysler has also stated that the solvent extraction method is an unproven technology. The EPA March 1988 Record of Decision Update identifies the selection of solvent extraction for two other Superfund sites: Palmetto Wood and Davis Liquid Waste. Furthermore, a solvent extraction process is already being used in the cleanup of the General Refining Superfund site (see the attached NUS Corporation response).

NUS
CORPORATION
WASTE MANAGEMENT SERVICES GROUP

PARK WEST TWO
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September 20, 1989
NUSP/89-0827

Mr. Craig DeBiase
Remedial Project Manager
U S Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

Subject: REM III PROGRAM - EPA CONTRACT NO. 68-01-7250
EWAN PROPERTY SITE, NEW JERSEY
RESPONSE TO CHRYSLER MOTOR COMMENTS OF
SEPTEMBER 11, 1989

Dear Mr. DeBiase:

Attached are the REM III responses to Chrysler Motor comments Executive Summary Section B, Section II item B.2, and Section III items A, B, C, E, and F. These comments were contained in the letter dated September 11, 1989, from David J. Hayes to James P. Rooney, Esq. and you.

If you need further assistance, do not hesitate to call.

Very truly yours,

Debra M Wroblewski

Debra M Wroblewski
Site Manager

DMW:vlp

Attachment

cc: G Latulippe
D Knapp
File: W A No. 130-2LA5
Daily

Chrysler Motors Corporation
Final Operable Unit Two Feasibility Study
Comments of September 11, 1989

Section I - Executive Summary

B. Remedy Selection

Response Paragraph No. 1:

The materials to be considered as part of Operable Unit One are the drums and their contents and the heavily contaminated materials (not soils) associated with the drums. The drums and their contents are obviously more readily identifiable. The purpose of adding "the heavily contaminated materials associated with the drums" was to prevent material that has leaked from or is unintentionally released from the drums from being left at the site until Operable Unit Two activities are initiated. This material would be considered a primary source of contamination in that it is a concentrated waste potentially in direct contact with the water table. The residually contaminated soil would be considered a secondary source of contamination, in that contaminants leach more slowly from it into the groundwater.

Response Paragraph No. 2:

The alternative includes the use of a solvent followed by water. Triethylamine (TEA) was the solvent used for discussion and costing purposes in the Feasibility Study (FS). Also, during excavation there is a potential for air emissions, as stated in the FS. Contingency plans, etc. will need to be prepared during the Remedial Design (RD) phase. TEA functioned well during our treatability studies and odors are only a problem if there is a leak in the system. TEA will be discussed further in response to comment Section III Item E.

Response Paragraph No. 3:

The pumping scenerios presented in the FS were developed to access the general implementability and effectivness of a groundwater collection system that utilizes extraction wells. As indicated in the FS, many pumping systems are considered viable and may be used during the Remedial Action (RA). The system to be used will be developed during the RD phase. Other groundwater collection systems (i.e., trenches) were eliminated from consideration.

As with the response to Paragraph 2, the system is not "required" to be implemented exactly as we have outlined in the FS. We selected pumping of the groundwater as the technology to be used at the site. The simplistic method of estimating the number of wells is for feasibility study purposes, not for design purposes. We feel that our system meets the FS guideline for developing costs that are plus 50% minus 30% (OSWER 9355.3-01).

Response Paragraph No. 4 and No. 5:

There is the potential at this site for a variety of contaminants to be associated with each drum. The alternative that is recommended by EPA is considered to provide the best overall remediation of contaminants at the site. The Remedial Investigation/Feasibility Study (RI/FS) guidance documents states "For those situations in which numerous waste management options are appropriate and developed, the assembled alternatives may need to be refined and screened to reduce the number of altrenatives that will be analyzed in detail". (OSWER 9355.3-01).

Further details are provided in responses made to comments within Section III.

Section II Item B.2 pages 13-15:

The soil cleanup goals are low because they are protective of the groundwater. The goals for semi-volatile organics were met after solvent extraction with triethylamine (TEA). Despite significant volatile organic reductions (99.998%) some of the goals were not attained. Minor adjustments to the process (increased temperature, etc.) should result in lower concentrations. It is anticipated, based on the results of the ASTM leaching procedure conducted on the TEA-treated samples, that inorganic concentrations can be reduced to low levels (See FS, page E-19). Solvent extraction followed by a rinsing step (as shown in Figure 3-9, page 3-27) should reduce the concentrations of both inorganics and organics to very low levels. Refinement of the treatment process will be necessary during the remedial design stage.

The groundwater treatment systems outlined in the feasibility study are anticipated to attain very low contaminant concentrations in the aquifer and are representative of the best available technologies. The methods that can be used to measure these low concentrations include EPA method 524.1 and 524.2. EPA or the State may have a preference for either of these methods. We used method 524.2 through Revet Environmental and Analytical Laboratory (through the Contract Laboratory

Program) for the supplemental groundwater sampling activities (see FS at page 1-41). The goals are, therefore, measurable.

Section III The Remedy Selected by the FS is not Supported by Adequate Data.

A. The Existing Data Base does not Support EPA's Attempt to Distinguish between "Heavily Contaminated" and Less Contaminated" Soils.

Response Item A:

As stated in the response to Paragraph No. 1 of the Executive Summary, the terminology is "heavily contaminated materials" and "residually contaminated soils". The commentors' use of the phrases "heavily contaminated soils" and "less heavily contaminated soils" is not correct. The treatability study evaluated the range of contaminated "soils" (i.e., a discrete worst case and a composite average). The composite sample was obtained from areas of known soil contamination that were not considered to be "heavily contaminated materials". These soil samples were collected in an effort to examine a range of situations that may be encountered during Operable Unit Two.

The TEA was effective for remediating the discrete worst case soil sample, not heavily contaminated materials. These worst case soils are included as part of Operable Unit Two. The fact that the worst case soils were effectively treated allows for a contingency factor if some of the heavily contaminated materials are are unintentionally left on the soils at the site after the Operable Unit One activities.

B. The Existing Data Base does not support the FS's Evaluation of the Extent and Nature of Soil Contamination.

Response Item B:

Our estimates are very conservative for both soil and groundwater volumes. The FS does not require 22,000 cubic yards of residually contaminated soil to be treated. The 22,000 cubic yards is an estimate, EPA could require only soil that exceeds cleanup goals to be treated.

The potential areas of concern is not nine acres; study Area A is nine acres in size. During the RI the affected area was estimated, conservatively, to cover an area of approximately four acres. The affected area is within Area A. Based on geophysical surveys, soil gas screening, and both mobile laboratory and Contract Laboratory Program (CLP) sample results, a focused area of approximately two acres (within the affected area) is considered to require remediation. See FS Section 2.1.2 and Appendix C. As stated above, the estimate of 22,000 cubic yards is a conservative estimate.

We agree that the site is characterized by localized areas of contamination (see Figure 2-1 in the FS). Seven localized areas that are anticipated to need remediation are currently considered. It is anticipated that these localized areas will be further subdivided during the design and implementation phases based on information obtained from Operable Unit One activities.

C. The FS's Soil Remediation Screening Process Improperly Excluded Cost-Effective Combinations of Technologies.

Response Item C:

In situ vacuum extraction is a technology to remove volatile (Henry's Law constant $>3x10^{-3}$ $atm-m^3/mole$) organic compounds (VOCs) from soil (EPA/540/2-88/004). See the attached listing of Henry's Law constants for the organic contaminants detected at the Ewan Property Site (Table 1). As can be seen, vapor extraction is potentially not effective for many of the organic compounds found at this site because their Henry's Law Constants are significantly less than $3x10^{-3}$ at $m-m^3/mole$. Because the trenches will have been excavated as part of Operable Unit One, preferential flow patterns and, therefore, inconsistant removal rates are anticipated. Modeling such conditions would also be very difficult.

The commentors ignore the fact that site specific treatability study results are available for solvent extraction and recommend the use of microencapsulation. Microencapulation, specifically HAZCON's process, is a solidification/stabilization technology that mixes hazardous waste, cement, water and and additive called Chloranan. The additive is claimed to encapsulate organic molecules so that they do not retard or inhibit solidification. HAZCON's process was demonstrated at a site in Douglassville, Pennsylvania. One of the major conclusions is that TCLP results for semi-volatiles (and oil and grease) were essentially the same for treated and untreated samples. Also, high volume increases accompany the treatment process. (Handout at the Third International Conference on New Frontiers for Hazardous Waste Management, Site Demonstration and Evaluation Branch, September 7, 1989.) The results of the SITE program's demonstration prove that the process is not effective for

TABLE 1

PROPOSED CLEANUP GOALS FOR SOIL AND HENRY'S LAW CONSTANT EWAN PROPERTY SITE, SHAMONG TOWNSHIP, NEW JERSEY

Chemical	Maximum Concentration Detected (µg/kg)	Soil Cleanup Goal(1) (µg/kg)	Henry's Law Constant atm-m^3/mole
Toluene	570,000	5.0	6.66×10^{-3}
Methylene Chloride	77,000	5.0	2.03×10^{-3}
Phenol	77,000	330	4.54×10^{-7}
Trichloroethylene	8,100	5.0	9.1×10^{-3}
Tetrachloroethylene	24,000	5.0	1.53×10^{-2}
Ethylbenzene	20,000	5.0	6.6×10^{-3}
Xylenes (total)	77,000	5.0	4.33×10^{-3}
Acenaphthene	9,700	330	9.1×10^{-5}
Di-n-butyl Phthalate	2,500	330	2.8×10^{-7}
Butyl Benzyl Phthalate	27,000	330	8.3×10^{-6}
4,4-DDE	50	440	6.8×10^{-5}
4,4-DDD	170	77	2.2×10^{-8}
4,4-DDT	17	16	1.5×10^{-5}
Heptachlor Epoxide	ND	8	3.9×10^{-4}
Pentachlorophenol	ND	2,650	2.8×10^{-6}
Diethyl Phthalate	ND	330	1.2×10^{-6}
Di-n-octyl Phthalate	1,400	102,344	1.7×10^{-5}
Bis(2-Ethylhexyl) Phthalate	28,000	102,344	3.0×10^{-7}
Anthracene	1,800	330	8.6×10^{-5}
Benzo(a)anthracene	ND	330	1.0×10^{-6}
Benzo(k)fluoranthene	ND	330	3.87×10^{-5}
Chrysene	ND	330	1.05×10^{-6}
Fluoranthene	2,300	330	6.5×10^{-6}

TABLE 1
PROPOSED CLEANUP GOALS FOR SOIL AND HENRY'S LAW CONSTANT
EWAN PROPERTY SITE, SHAMONG TOWNSHIP, NEW JERSEY
PAGE TWO

Chemical	Maximum Concentration Detected (μg/kg)	Soil Cleanup Goal(1) (μg/kg)	Henry's Law Constant atm-m^3/mole
Fluorene	2,100	330	6.4×10^{-5}
Phenanthrene	77,000	330	2.26×10^{-4}
Pyrene	ND	380	5.1×10^{-6}
2-Butanone	44,000	10	2.08×10^{-5}
2-Hexanone	11	10	7.52×10^{-6}
2-Methyl Naphthalene	440,000	330	6.02×10^{-4}
4-Methyl-2-pentanone	97,000	10	4.16×10^{-5}
Acetone	110,000	10	3.4×10^{-5}
Dibenzofuran	2,000	330	NA
2,4-Dimethyl Phenol	ND	330	1.7×10^{-5}
4-Methylphenol	ND	330	2.37×10^{-7}
Benzene	ND	5.0	5.5×10^{-3}
1,2-Dichloroethane	ND	5.0	9.14×10^{-4}
1,1,1-Trichloroethane	ND	5.0	3.0×10^{-2}
Carbon Tetrachloride	ND	5.0	2.3×10^{-2}
1,1-Dichloroethene	ND	5.0	1.9×10^{-1}
Chloroform	ND	5.0	2.8×10^{-3}
Napthalene	ND	330	4.6×10^{-4}
1,1-Dichloroethane	ND	5.0	4.26×10^{-3}
Tetrachloroethene	24,000	5.0	1.53×10^{-2}
trans-1,2-Dichloroethene	ND	5.0	6.7×10^{-2}

ND	Not detected at concentrations higher than contract required detection levels.
--	No goal currently established.
(1)	Basis for cleanup goals is described in Appendix B.
NA	Not readily available.

organics. Since protection of the groundwater at this site is a major concern, the fact that semi-volatile organics leach at essentially the same rate before and after treatment is a major concern. In fact, in the abstract from the paper that the commentors reference (EPA/540/A5-89/001) on HAZCON's process if it states "...the process does not immobilize volatile or semivolatile organics in most instances..." and that "...the microstructure indicates a potential for degradation over the long term...". This process, as if currently exists, should not be considered for use at this site.

As with alternative 3S in the FS, there is a large volume increase and the pH of the mass would remain high, potentially causing detrimental effects to the sensitive Pinelands ecosystem. As stated on page 2-1 of the FS, the overall goal of the site remediation is to clean up the site to its orginal condition prior to disposal, thus enabling unrestricted use of the area. Placing a solid mass back onto the site would not attain this goal. Our treatability studies for stabilization evaluated lime, flyash, and a lime/flyash mixture in an effort to stabilize the inorganics without creating a solid mass. The treatability studies produced negative results.

Several major comparisons are:

- The use of microencapsulation for organics is not proven effective. Conversely, positive site-specific treatability study results were obtained for solvent extraction.

- With in-situ vacuum extraction followed by microencapsulation, semi-volatile organic compounds and inorganic compounds would remain at the site. Conversely, with Alternative 4S volatile and semi-volatile organics and metals are removed from the site.

- A solid mass of substantially more volume would be placed back on site after microencapsulation. Conversely, with Alternative 4S the treated loose soil would be placed back on site and there would be no volume increase.

- With microencapsulation long-term monitoring would be required. With Alternative 4S the contamination is removed and there is no potential for further contaminants to leach into the groundwater, therefore, no long-term maintenance is expected.

In conclusion, as part of our treatability studies the combination of devolatilization followed by stabilization was evaluated. The devolatilization step was conducted under a vacuum (30 mmHg Absolute) at elevated temperatures (130°C). The elevated temperature was used in an attempt to remove volatile and semi-volatile organics. Excellent volatile organics removal was documented. Semi-volatile organics concentrations were not effectively reduced, even when subjected to elevated temperatures. Since a solid mass was not desired, cement was not tested. Lime, flyash, and a lime/flyash mixture were tested. This combination of different cost-effective treatment technologies was not effective as tested.

E. There Are Serious Issues Related to the FS's Preferred Soil Remediation Alternative That Have Not Been Addressed.

Response Item E:

The results shown on page E-18 are after the solvent extraction only. The rinsing stage did not occur. See page E-19. The use of TEA increases the solubility of inorganic compounds suggesting the potential benefits of subsequent water washes. The ASTM Leachate results shown on page E-18 support this point for rinsing following extraction with TEA. Since hexane and water had no significant removal of metals and since their solubility was not increased making them easier to remove, we selected the use of TEA followed by water rinsing as part of Alternative 4S.

The most significant potential for volatile releases is anticipated to occur during Operable Unit One. It is assumed that during excavation of the drums volatile emissions will be controlled. Costs for controlling volatile emissions were also included for Operable Unit Two activities, however, details (foam, portable structures, etc.) is left until the design stage.

The commentors again assume that the FS requires them to use TEA; this is not true. However, responses to the four specific comments about the use of TEA are provided.

- Based on the treatability studies that we conducted, TEA provided the best removal efficiencies for volatile and semi-volatile compounds.

	Removal Efficiencies		
Parameters	TEA	Water	Hexane
Semi-volatiles	99.8%	96%	98.7%
Volatiles	99.998%	99.993%	99.97%

As can be seen the removal efficiency for TEA is slightly better than water or hexane. However, the commentors overlook one very significant point. The process used for TEA increased the solubility of inorganics enabling them to be rinsed from the soils. This is not true for the processes that used water or hexane. For these later two processes, inorganics would remain in the soil requiring further treatment.

- The commentors state that TEA solvent extraction is somewhat experimental and that an EPA representative stated that it is an emerging technology requiring further development and refinement. A definition of terms problem exists here. The EPA representative means that the patented B.E.S.T process (that uses TEA) is an innovative technology-developed, but not in widespread use. The use of the term emerging technology is unfortunate and not correct here. Emerging means that the technology has not progressed beyond tthe laboratory stage of development. This is not the case with the B.E.S.T. process.

  The B.E.S.T. process dates back to the mid 1970's Resources Conservation Company (RCC) built the first truck mounted pilot B.E.S.T. unit in 1975. This unit was operated at numerous sites and the data generated at these sites was used to refine the slurry handling, continuous extraction, and solvent recovery/recycle operations of the process. In 1984, RCC built the second generation B.E.S.T. pilot unit to develop the data necessary to design a full scale commercial B.E.S.T. unit for treating RCRA listed petroleum refining oily sludges. Data from this pilot unit was used to design the commercial scale B.E.S.T. unit.

  The full scale B.E.S.T. unit was used at the General Refining Superfund site to treat 3700 yd^3 of acidic oily sludges. At this site, soils were slurried and treated with this unit. Currently, RCC is operating a third generation pilot unit to develop the data necessary to configure a B.E.S.T. unit specifically for treating contaminated soils.

- The process that is used by RCC is designed so that no TEA will be released into the air as air emissions. The only time an odor should be detected is if there is a leak in the system. If a worker, or nearby resident, were to detect the odor of TEA this would indicate that the system is not operating properly.

- Low levels (<200 ppm) of residual TEA may be left in the treated soil (EPA-600/2-82-001a). This amount of TEA is biodegradable in 11 hours by Aerobacter, a common soil bacteria. After treatment the material may be staged for a period before it is backfilled into the excavated areas. The TEA remaining in the treated soils is ionically bound and not volatile and as such does not cause an odor problem.

F. The FS's Recommended Groundwater Pumping Scheme is not Supported by Sufficient Data.

Response Item F:

The commentor again wrongly assumes that the pumping schemes developed in the FS are required to be constructed as described. Many viable pumping schemes may be considered in more detail during the design stage. The pumping schemes developed in the FS are used to support the fact that extraction wells, and not some other type of collection system (i.e., trenches), are implementable and effective at the site.